DUN'S REVIEW and Modern Industry

A DUN & BRADSTREET PUBLICATION

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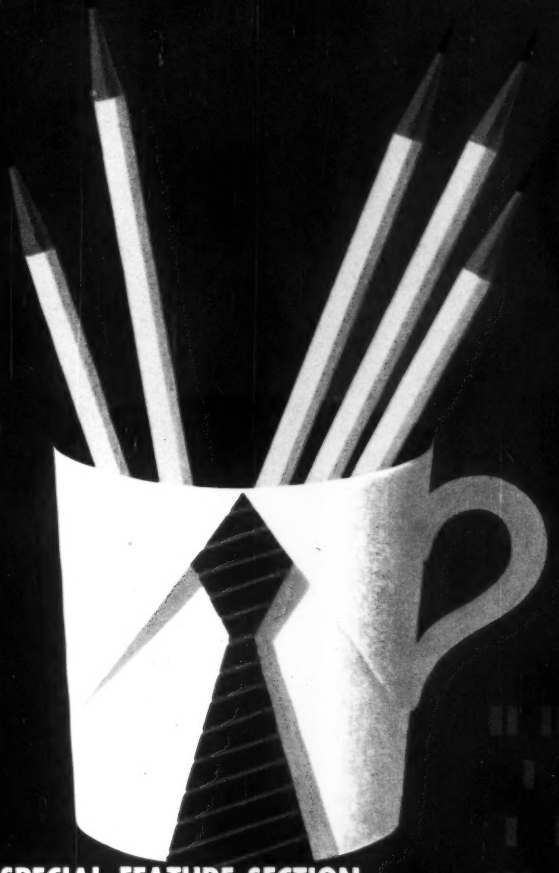
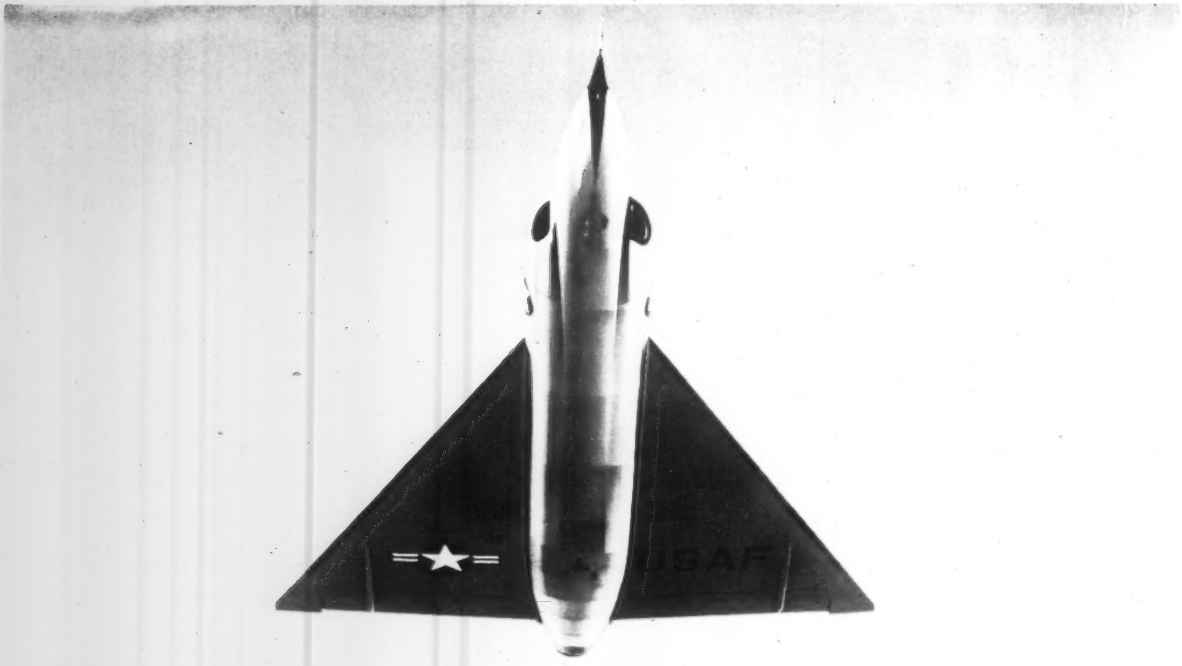


SPECIAL FEATURE SECTION

THE AMERICAN OFFICE: TODAY AND TOMORROW

Plus Other Articles and Features

when you need



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DUN'S REVIEW
and Modern Industry

Volume 70 No. 4

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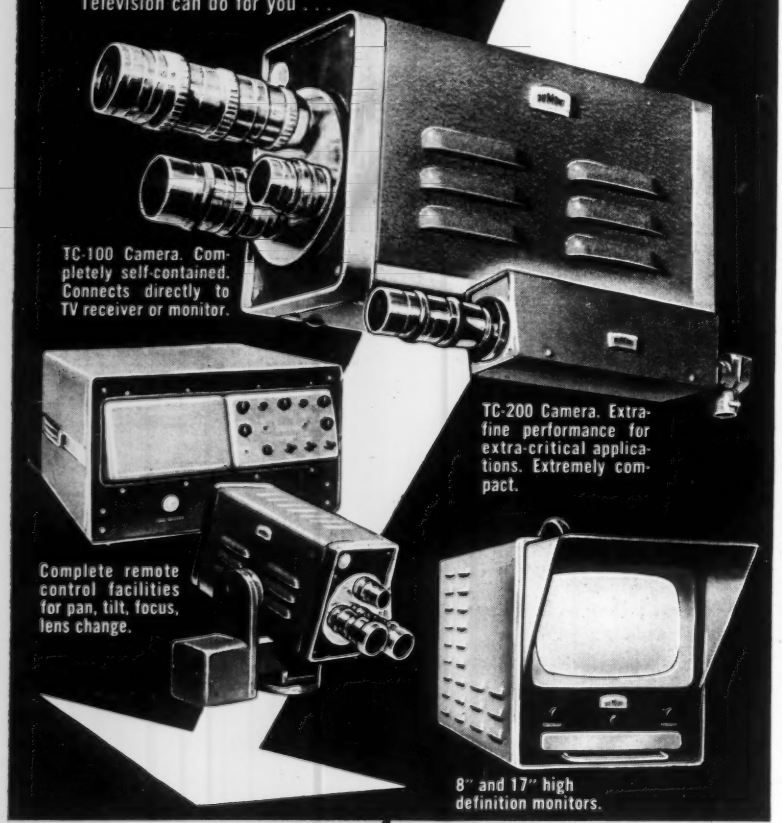

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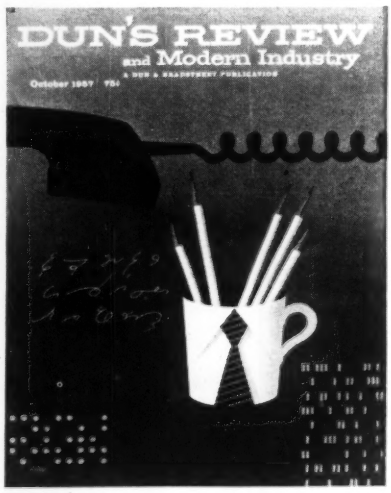

Changing fast to keep pace with management's needs for up-to-date information, the office is becoming a sensitive instrument to guide executive action. Our cover artist this month is Robert Hallock, whose work has appeared in leading national magazines.

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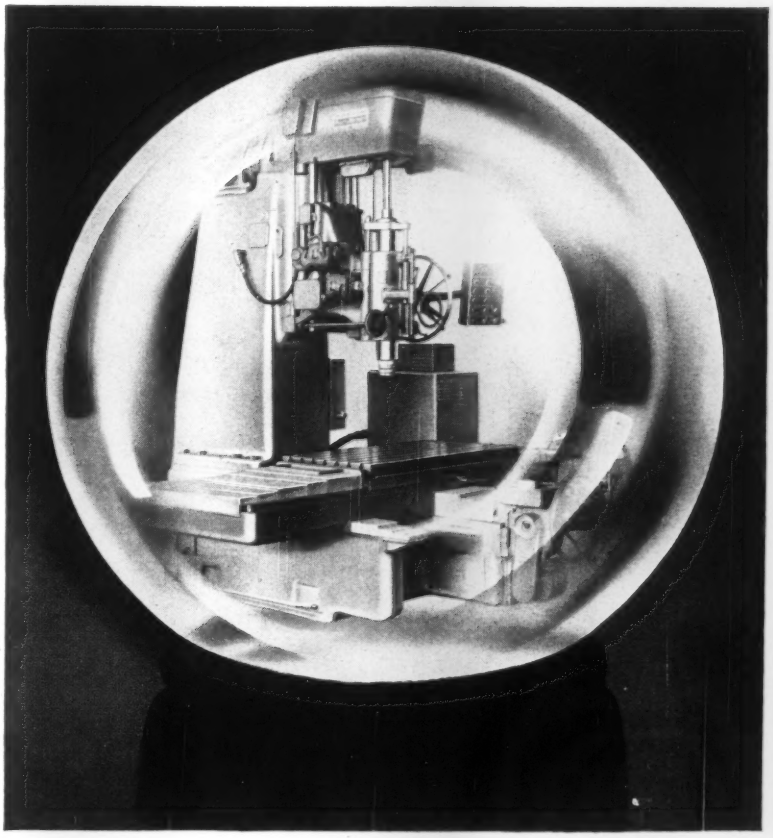
the REVIEWING STAND

• Small business refuses to lie down and play dead despite all the dirges that have been played by the sad-sack prophets. Richard Sanzo, who set up a definition of "middle business" last year in his article "Major Problems of Middle Business," armed himself with a quick but definitive sample of small business opinion for his study of small business in this issue, using the 42 cities where DUN & BRADSTREET maintains district offices. His information is hot off the statistical griddle. The face-to-face interviews developed the rich grass-roots philosophy that Sanzo quotes from the manufacturers, wholesalers, and retailers, who are a bit indignant at the Digger O'Dell pathos of politicians. However, the problem of definition of size still confuses the issue. One DUN & BRADSTREET man called on a northwoods merchant who had the only store in a community of 971 souls. The merchant brushed away the first question with: "Small business, son? I wouldn't know. You see, up here I'm Big Business."

• The American mother in the 19th century was eager to see her boy change his attire from overalls to a sack suit as evidence of social upgrading. Once he could wear a white shirt and sport clean fingernails he was out of the "laboring class." There was usually more money for the man behind the desk, or at least steady employment and income. Pencil-pushing often led to supervisory assignments, and occasionally to executive responsibilities.

Today, the craftsman does as well as or better than his typical white collar neighbor, and the social distinction is pretty dim when you meet the boys on the street in their Sunday best. Even the situation of unskilled labor is radically changed. An executive who asked a contractor where he could obtain some unskilled labor for trenching in the rocky terrain around his country home was told, "The only unskilled laborers in this valley are executives." With that the executive rolled



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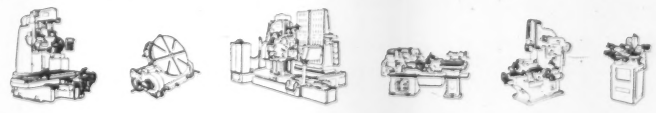

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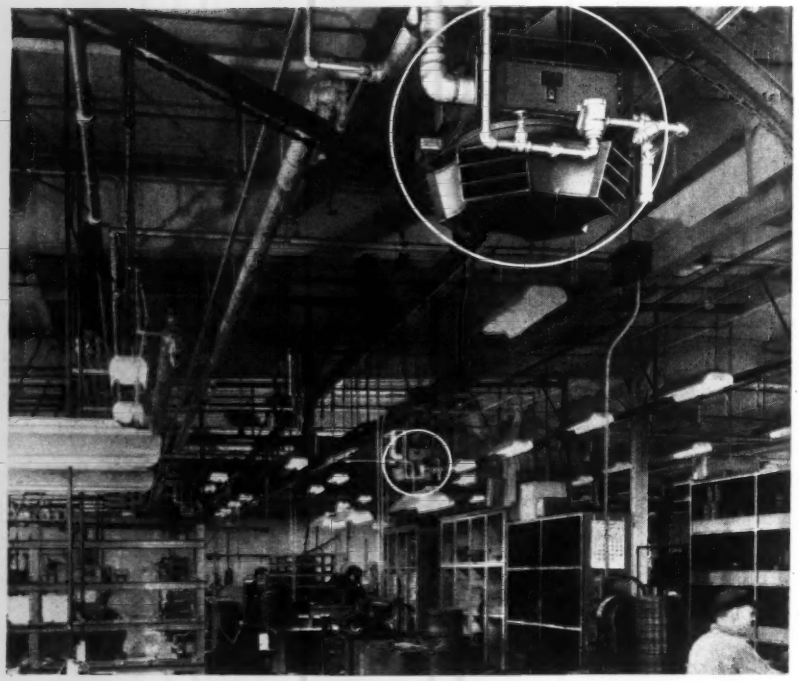

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You know how it is in some plants (perhaps in yours) . . . some lucky worker is located just *between* the steady fixed streams of hot air from the unit heaters, and he's the envy of the rest of the crew. Especially of those directly in the path of the hot air streams.

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up his sleeves, spit on his palms, and went to work. He paid himself $1 an hour, but admitted he was overpaid on the basis of his production. But the white collar worker is not so far behind the factory worker as some people think. Horace E. Sheldon demonstrates in his article.

• The square-foot cost of maintaining files is an important expense factor as city real estate rises in value. How much paper work is really necessary for the records? Robert A. Shiff, in "We Needn't Drown in Paper," points out that in 1900 each American consumed an average of 60 pounds of paper. In 1957 the consumption average is 400 pounds. (Of course, not all the paper is used in typewriters, tabulating machines, textbooks, or spitballs.) And, despite the gain in paper consumption and necessity for keeping financial data for tax purposes, many small businesses do not keep proper records. Keeping files accurate also implies keeping them free of deadwood. Cleaning the files is a matter of good housekeeping first, and good management second. Most executive files are cluttered up with excessive items —obsolete catalogs, price lists, and duplicates. Mr. Shiff points to the economic benefits that result from the proper training of the employees in maintaining records. Good files, like good figures, can be slimmed down and be healthy as well.

• The staff versus line arguments are never-ending because there is no answer to a question which belongs to the ancient "chicken or egg" category of debates. Who makes the successful marriage, the husband or the wife? Either can make marriage a failure, but it takes both to make marriage a successful union. The same is true of the creative impulses of the staff man and the dynamics of the line executive. Together they give purpose, movement, and sustained direction to management planning and action. A debate on relative merits usually evokes lopsided evidence, which if treated with a sense of banter may do no harm. Taken seriously, such discussions become defensive in particular and offensive in general, and contribute nothing to the team play of the key management personnel. We may develop this theme in a later article. —A. M. S.

How Standard Oil finds new solution to machinery maintenance problems

Grease with unique properties result of five-year research project

In oven test, grease samples on metal strips were baked in oven at 350° F. for five days. Only RYKON *Grease remained workable.*

FIVE YEARS AGO Standard Oil launched a research project to develop a grease with properties not possessed by any other lubricant. This research resulted in a new line of greases to which Standard Oil has given the name RYKON. RYKON Greases have undergone severe laboratory and field testing. In these tests the greases demonstrated a remarkable ability to continue to provide lubrication after other greases failed. The greases show unusual mechanical, oxidation, high temperature and low temperature stability. They show exceptional resistance to water washout, to oil separation and to change in consistency. They have superior rust preventive properties.

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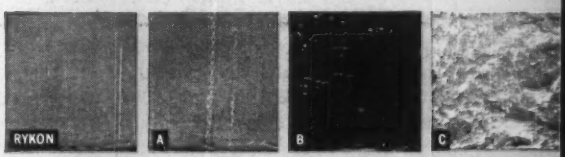
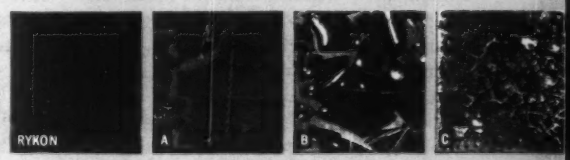
Further information about RYKON Greases will be sent to your plant management and maintenance men upon request. Just call your local Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 So. Michigan Avenue, Chicago 80, Ill.



BEFORE. Samples of greases prepared for baking test.



After test, RYKON stayed grease-like. Other greases dried, turned asphaltic.

STANDARD

STANDARD OIL COMPANY
(Indiana)

HEARD IN WASHINGTON

WASHINGTON, D.C.—Recognizing that it faces a hectic year, the House Ways and Means Committee will begin hearings on tax matters the day after Congress meets in January. While it would be impossible to rid a revenue measure of political pressures, the Committee is making an extraordinary effort to get its studies on a businesslike basis, as free from politics as possible.

Rep. A. S. Herlong, Jr. (D., Fla.), expresses a view in which most of the other Committee's members concur. "Excessive use of bank credit," he says, "is the engine of inflation. At present the engine is fueled by arbitrary restriction on savings imposed by tax rates. The matter is of such importance that every effort should be made to avoid partisanship." Herlong has joined with Rep. Antoni N. Sadlak (R., Conn.) in proposing progressive reductions in income and corporate taxes, and their proposal is expected to be made the starting point of the hearings, the purpose of which is to find ways of removing tax "road blocks in the path of economic progress." Four principal arguments are advanced to emphasize that point:

1. Inadequate savings inevitably result in excessive reliance on bank credit, which, when used as a substitute for new capital from current savings, can only insure a continuing inflationary tendency at the cost of economic growth.

2. If savings are inadequate and restrictions on new bank credit hold down the inflationary thrust and hence slow up our rate of growth, then the chief sufferers are the citizens in the lower income brackets, since it is they who stand to gain most from greater production, more and better jobs, and the consequent increase in the country's living standards.

3. Inadequate savings are a barrier to the development and expansion of business and make it most difficult for small business to finance its operations and expansion.

4. Limitation on the formation of capital out of current income is especially harmful to the sections of the country that are the least developed industrially.

Under the Herlong-Sadlak bill corporation taxes would be reduced from the present 52 per cent to 50 per cent in 1958, 48 per cent in 1959, 46 per cent in 1960, 44 per cent in 1961, and 42 per cent in 1962.

Appraisals of the record of the first session of the 85th Congress vary widely. Some believe it should rate lower than the so-called "do-nothing 80th" Congress. Others proclaim that it was a good Congress not only for the things it did, but for the things it prevented—higher spending, for example.

The President himself was "tremendously disappointed." Many of his requests for legislation were not considered. Others were granted only in part. In naming the proposals that failed of passage he put the request for legislation requiring publication of union financial reports and registration of welfare and pension funds at the head of the list. Other examples he cited were the emergency corn program, highway advertising legislation, tax relief for small business, flood insurance, the plan to make interest rates on Government loans equal to the rate the Treasury has to pay, and higher postal rates. He put special emphasis on the "inadequacy" of the support for the mutual security program.

Certainly little was done in the field of business as such, except for the Small Business Administration extension, aids to housing, and the airline industry, and the Niagara Falls power project. Corporation and excise taxes were continued, but that was a perfunctory action.

However, there is little legislation that does not have an indirect effect on business. Business has a stake in such things as the Middle East Doctrine, the International Atomic Energy Agency, foreign aid, protection of FBI files, disposal of agricultural surpluses, and relaxation of immigration restrictions.

The failure of Congress to act does not mean that all the bills are dead. In the second session, there may be final action on the school construction program, the natural gas bill, statehood for Hawaii and Alaska, extension of the minimum wage law, aid for distressed areas, OTC membership, postal rates, and Taft-Hartley amendments.

Senator Prescott Bush (R., Conn.) wants an addition made to the declaration of policy in the Employment Act of 1946. He would add that all agencies of the Government "must utilize all practicable and available means to combat inflationary pressures."

The only Administration objection to the additional language is that it places too much emphasis on stability of the cost of living. At what level should the cost of living be stabilized? Is it desirable to stabilize it at the present level or some other level? The idea is to keep away from making goals too specific. There must be

[ANOTHER MUZAK CASE HISTORY]

How easing of worker tension with music upped production 5%, cut absenteeism 5%

in the offices of
NATIONAL GYPSUM COMPANY, Buffalo, N. Y.—home of
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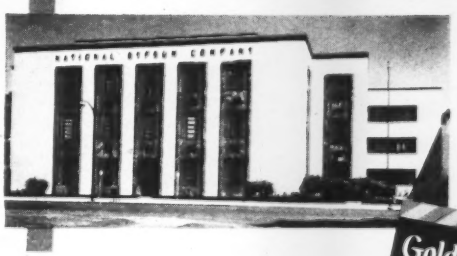

ALWAYS FORWARD-LOOKING. *The National Gypsum Company was the first large office in in Western New York to install* MUZAK *and the first office anywhere to use the principle of the speaker hidden behind an acoustical panel.*

R. R. HARLEY, Office Manager of The National Gypsum Company home office in Buffalo.

MANAGEMENT SKILL of a high degree has gone into making GOLD BOND a famous name in building products. This skill has also been applied in the *home office* of the manufacturer, The National Gypsum Company.

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Other MUZAK "Success Stories"

This MUZAK "success story" has been repeated many times over. A work clothes manufacturer in Denver made a comparison of piece-work production during a four-month period before they had MUZAK, and a comparable four-month period after MUZAK, and noted a 10% increase in output per operator.

A Tennessee lime and cement company tested MUZAK in its drafting room and reported a productivity increase worth $300 to $400 a month. A power company found that the key-punch production of its IBM machine operators reached an 11-year high after MUZAK was installed, while errors took a sharp turn downward. And these are typical of the results reported by many of the upwards of 20,000 companies which subscribe to MUZAK.

Why MUZAK Is So Different From Ordinary "WORK MUSIC"

How can "just music" accomplish results like these? The answer is simple. It *can't!* For MUZAK is not "just music." It has spent twenty years perfecting a *scientific* way to meet the minimum requirements for a successful work-music program:

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YOU NEED SCIENTIFIC PROGRAMMING to suit the time of day, place and type of work activity. Each MUZAK program is based on 20 years' study of the effects of music on people.

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OFFICES find MUZAK cuts down errors . . . lessens day-dreaming, bickering, restlessness.

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STORES AND SHOPS report that MUZAK makes sales clerks friendlier; promotes impulse buying; encourages customers to linger longer, buy more.

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Type of Business ..... No. of employees .....

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The Man At The Top Of Our Organization Chart ...Is You!

TED BAKER
Senior Vice President
Spector-Mid-States

THE PHRASE *"Customer Service"* is much with us these days. And for very good reasons, indeed. For never before in the history of American commerce has the job of satisfying the man who pays the bills taken on such large proportion. The customer is not only king . . . he's the whole royal court.

When, in the fall of 1948, we of the Spector—Mid-States management group sat down to map the course of our Company's future and draw up the organization chart that was to guide our growth and expansion, someone at the big table casually suggested that we "put the customer at the top of our organization chart". Now here was a really unique idea! Especially in a day when demand far outstripped supply—and the customer was far less important than getting the goods produced.

"Put the Customer at the Top of the Organization Chart". The more we thought about the idea the better sense it made. We realized, even then, that we were on the threshold of a major industrial revolution—a revolution in distribution. There were and would be significant changes in producing, selling and buying in the immediate future. (And changes there were!) If we were to fulfill our objective—the efficient transportation of goods at *all* levels of distribution—it became imperative that we acquire a close and thorough appreciation of this dynamic market.

And so we made two decisions: First, we would put the customer at the top of our organization chart. Second, we would build our organization and facility under his *expressed* direction.

We set up a number of basic techniques for studying the continuing needs of our customers. One, the Customer Conference where each month at each terminal location we invite a number of shippers from all phases of industry to participate in business seminars with our salesmen, drivers, terminal managers, top executives. We can directly point to the recommendations and observations made at these meetings as perhaps the most important influence in shaping the methods and facilities employed by us today. The Customer Conference gives our non-sales people a fine opportunity to meet with and better understand the problems and expectations of our customers. In addition to the Customer Conference, we further our investigation through salesmen interviews and mail surveys. Our management and research staff review these suggestions diligently.

Just what does the Man at the Top of Our Organization Chart ask of us? First, he asks, "Give us a mass transportation service that is comprehensive in scope at a price we can afford. Give us a service that is dependable and friendly. Give us equipment that is specifically designed to handle and transport our products safely and economically. Provide us with selling, operating and administrative practices that blend well with our own. Give us, in short, a freight transportation service that will help us do our own job more efficiently—*that will enable us to satisfy our customers*".

And so we set to the task of providing for the wants of our new Head Man. It was not of a day's doing, nor of a year's.

Through our various conferences and interviews one observation was made clear: we would be as good as our people. For unlike the producers of goods for resale, our product was service—and service is people. We committed ourselves then, as today, to building an organization in which every man and woman from president to driver, from switchboard operator to terminal manager, from dockmen to dispatcher would reflect our Company's philosophy of *Customerized* service. We went into other industries—plastics, education, law—as well as our own to find young people with management potential. We invested a good part of our time and dollars in developing the aptitudes, the abilities and attitudes we found our customers desired. We leaned heavily—and still do—upon the vast experience of our wise elders before putting any of our new procedures into the field. The development of people, newcomers and oldtimers alike, is more than a management objective with us . . . it's a preoccupation!

It goes without saying that basic to any productive transportation service is an efficient physical plant — modern terminals, strategically located; a complete range of line-haul power and trailer units; a versatile city fleet. We invested in these. We invested, too, in the research and development of electronic inter-terminal communications and billing, in metropolitan radio dispatching. Our every move was preceded by the careful scrutiny and approval of the Man at the Top of Our Organization Chart.

Yes, customer service is more than a platitude at Spector—Mid-States. So important is this concept that this year we have established a complete Customer Service Section as part of our Sales Division. This section is staffed by a group of able, marketing-minded men and women whose responsibility it is to make sure that *all* of our departments perform to our high standards of customer service. This group is charged with the responsibility of our continuing study into your problems and needs. Any and all of our sales, public relations, and operating procedures may be altered under their recommendation. The next Customer Conference you attend will have been planned, held and reviewed by our Customer Service people. The next Directory of Points Served, the next Terminal Service Card you receive will be prepared under their guidance. Our telephone procedures, our tracing techniques, our employee development activities—all are within their province. All are conducted in terms of attaining fullest customer satisfaction.

Customer Service as we define the term is: *helping you serve your customers.* We at Spector—Mid-States fully recognize the economic implications of making sales and keeping customers. We recognize, too, the great potential we and other carriers are capable of contributing to your marketing progress. Lowered inventories, immediate availability of goods and materials, and lower delivered-price are but a few. We are fully aware of the fact that the more competitive advantage we provide you, the greater the likelihood that we will enjoy your continued confidence and patronage. And we, like you, need sales.

Yes, *Customer Service* is a phrase very much with us these days. That is how it has always been at Spector—Mid-States. That is how it will always be.

• • •

H. E. "Ted" Baker, Senior Vice President and member of the Board of Spector Freight System, Inc., ranks among the important names of American transportation. His more than 25 years in the field includes an active role in fostering motor freight public and industrial relations. He is a member of the Mid-West Eastern Seaboard Conference; on the Board of Governors of the Regular Common Carrier Conference and a member of the Executive Committee of the American Trucking Associations; past President of the Central Motor Freight Association of Illinois and Chairman of the Board. Baker, his wife Jean and their two sons reside in suburban Palos Park, Illinois.

What's new under the Borg-Warner sun

High on the list of Borg-Warner activities is new product development. Contributing importantly to this aspect of continuing growth are many promising new products recently introduced or currently under test.

For example, an 8-speed automatic transmission for trucks over 19,000 pounds. Now being road tested under the most grueling conditions, it may well revolutionize the driving of heavy trucks . . . A simpler, lighter, quieter marine transmission now in production . . . An almost human electro-mechanical manipulator for remote handling of radioactive material . . . A highly efficient electrostatic air filter for home heating and air conditioning systems . . . An advanced type fuel injection system for cars of the future . . . A remarkable new power-shifting transmission for heavy duty, off-the-road vehicles to help speed the nation's gigantic highway program.

Each of these noteworthy new products, and many others being developed, reflects Borg-Warner's continuing aim: "design it better—make it better". And that means more and better products benefiting almost every American every day.

Design it better ENGINEERING B-W PRODUCTION *Make it better*

BORG-WARNER®

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elbow room, it is contended, in which to administer the Employment Act effectively.

If the reciprocal trade act is extended beyond June 12 its friends will have to put up a determined fight. So many interests are feeling the effects of competition from foreign-made products that pressure for repeal or drastic amendment will come from nearly every state.

Reports from the twelve economic areas into which the Federal Reserve System is divided, FR officials say, indicate the following:

- Business is emerging from the Summer trough created by vacations and hot weather drags, and business opinion is shifting toward optimism. While the recent rise in dollar activity can be accounted for largely by increased prices, the economy is now shifting into higher gear.
- Tax cuts are not needed to stimulate business activity. The underlying strength and resiliency of the economy have been underestimated, and its natural bent is for growth.
- Government spending tends to cushion the reverberations from increases and declines in consumer demand for different products, and since Government is expected to continue taking about the present bite from the income pie, chances favor a continuation of economic growth in the years ahead, at about the average postwar rate.
- While the number of farms is declining at an increasing rate, capital investment in farms has increased and so has the rate of current farm expenditures. Farm purchases are made in larger quantities.
- Increased Social Security payments are proving of particular benefit to farmers.

Hope springs eternal in the breast of the public official. Many in Washington feel that in 1958 automobiles and housing will get out of the rut they are in. A boom in those two segments of the economy would go far toward making 1958 another very prosperous year.

Paul Wooton

for your new plant — in B&O's Land of Big Opportunity.
Follow the lead of "standout" industries, *Plan with a B&O man!*

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Constantly *doing things*—better!

COMPLETE *Finishing* SYSTEMS

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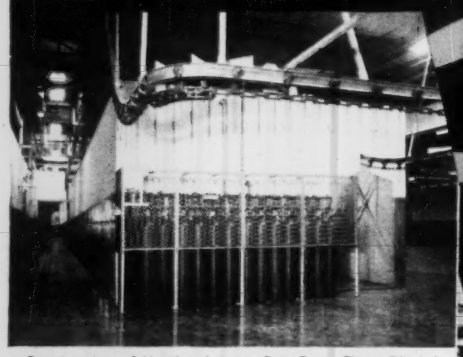
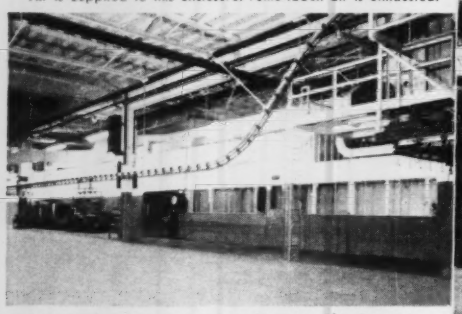
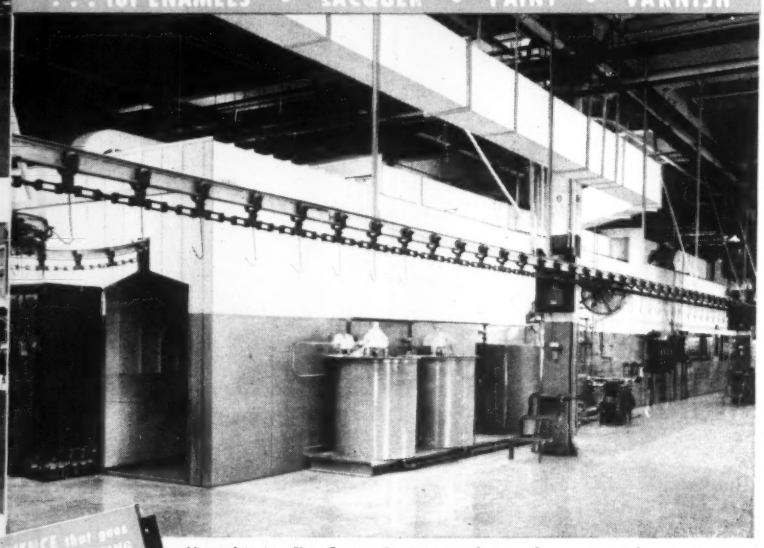


Exterior view of Ventilated Active Drip Zone. Clean, Filtered Air is Supplied to this enclosure. Fume-laden air is exhausted.

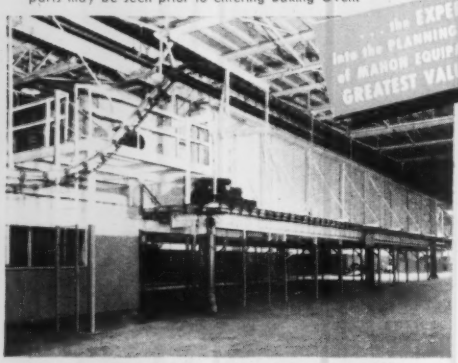


View showing glass in one side of Inactive Drip Zone where parts may be seen prior to entering Baking Oven.

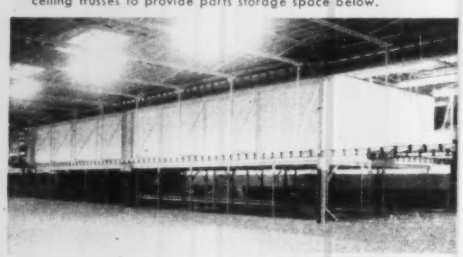


View of Mahon Flow-Coating Equipment at Chrysler Corporation of Canada, Limited. This is part of a Complete Mahon Finishing System for Coating Black Enamel Parts.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



View of Mahon 450° Enamel Baking Oven. Oven is built against ceiling trusses to provide parts storage space below.



nother view of the Enamel Baking Oven. Finish is baked for 20 minutes at 450° in this 80 Ft. x 24 Ft. Mahon Oven.

Black Enamel Parts at CHRYSLER CORPORATION of CANADA, LIMITED, are FLOW-COATED in MAHON FINISHING SYSTEM!

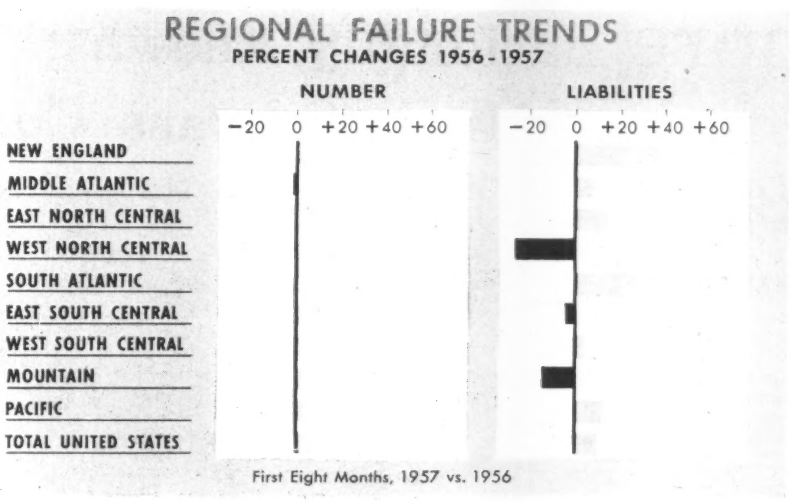
In addition to the body finishing system at the Windsor plant of Chrysler Corporation of Canada, Limited, Mahon also installed a complete finishing system for black enamel parts. This is a Flow-Coating System which includes a Mahon Flow-Coating Machine, a Ventilated Active Drip Zone, a Ventilated Inactive Drip Zone, and a 450° Finish Baking Oven with storage space below. Two Enamel Mixing Tanks and a Solvent Tank are provided outside the enclosure. The recirculating unit is equipped to automatically maintain the enamel at a specific temperature in the Flow-Coating Chamber. This is a typical Mahon Flow-Coating System, complete in every detail —automatic from start to stop. If you have a finishing problem, or are contemplating new finishing equipment, you will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. Whether your job is to be Flow-Coated, Dip-Coated, or Spray Painted either Manually or by Electrostatic Process, you will find that Mahon equipment will serve you better, because it is engineered better and built better for more economical operation over a longer period of time. Mahon will do a complete job for you on one contract—undivided responsibility for the entire system insures proper coordination and safeguards you against complications which can upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-657.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON



Total Up, Liabilities Down

ISING 8 per cent in August to 1,145, business failures deviated from the seasonal downtrend that usually runs from June through September, and reached the highest number in three months. Not only did casualties edge 4 per cent above the 1,101 occurring last year, but they exceeded slightly the prewar totals for August in 1939 and 1940.

However, the picture becomes less gloomy when failures are related to the listed business population. Concerns succumbed at a rate of 53 per 10,000 enterprises listed in the DUN & BRADSTREET *Reference Book*, as shown by DUN'S FAILURE INDEX, which projects monthly mortality to an annual basis and adjusts for seasonal fluctuations. While this rate was more severe than the rate in any other month of 1957 except March and represented a sixteen-year high for August, it remained well below the rate of 71 or 72 prevailing in 1940 and 1939.

Liabilities Drop

Contrary to the trend in number of casualties, dollar liabilities continued downward for the fourth consecutive month, dipping to $43.5 million in August. Although more businesses failed with medium-sized losses than in the previous month, those involving $100,000 or more were the least numerous since November of last year. Liabilities fell 21 per cent short of the volume in August 1956, principally because casualties in the million-dollar class diminished from 8 a year ago to 2 this August.

All industry and trade groups suffered heavier tolls during the month. Manufacturing failures rose noticeably in the machinery and transportation equipment industries, where almost twice as many concerns succumbed as in July. Casualties in wholesaling surged up 31 per cent, with most of the rise concentrated in building materials and general merchandise trades.

Among retailers, mixed trends prevailed between July and August.

THE FAILURE RECORD

	Aug. 1957	July 1957	Aug. 1956	% Chg.†
DUN'S FAILURE INDEX*				
Unadjusted	48.1	44.5	46.5	+3
Adjusted, seasonally	53.4	47.8	51.7	+3
NUMBER OF FAILURES	1145	1059	1101	+4
NUMBER BY SIZE AND DEBT				
Under $5,000	163	165	198	−18
$5,000–$25,000	565	530	515	+10
$25,000–$100,000	342	279	269	+27
Over $100,000	75	85	119	−37
NUMBER BY INDUSTRY GROUPS				
Manufacturing	204	181	195	+5
Wholesale Trade	97	74	98	−1
Retail Trade	588	570	567	+4
Construction	165	153	146	+13
Commercial Service	91	81	95	−4
LIABILITIES (in thousands)				
CURRENT	$43,514	$44,299	$55,040	−21
TOTAL	43,810	44,470	55,363	−21

*Apparent annual failures per 10,000 listed enterprises listed in the DUN & BRADSTREET *Reference Book*.

†Per cent change, August 1957 from August 1956.

In this record, a "failure" occurs when a concern is involved in a court proceeding or in a voluntary action likely to end in loss to creditors. "Current liabilities" here include obligations held by banks, officers, affiliated and supply companies, or the governments; they do not include long-term publicly held obligations.

OUTPERFORMS and Out Values all lift trucks in its class

Regardless of Price!

PRICE $3975.00

"WE INVITE COMPARISON"

1500 lbs LOAD CAPACITY

ENGINEERED YEARS AHEAD

- Complete bearing control throughout
- Synchronized 12-volt heavy duty system
- Feather-controlled stops
- Equipped with automatic charger and heavy duty industrial battery
- Self-aligning dual floor brakes

OPERATES IN 28" AISLES

APPLICATIONS

- Hydraulic loading, unloading, stacking, moving, any type of material...in large or small plants.

MORE THAN 40 BIG JOE MODELS

- Range up to 2000 lbs. capacity
- Lifting heights to 130"

NEW 24-PAGE CATALOG

In-Between Handling is our business! Write for our new 24-page catalog.

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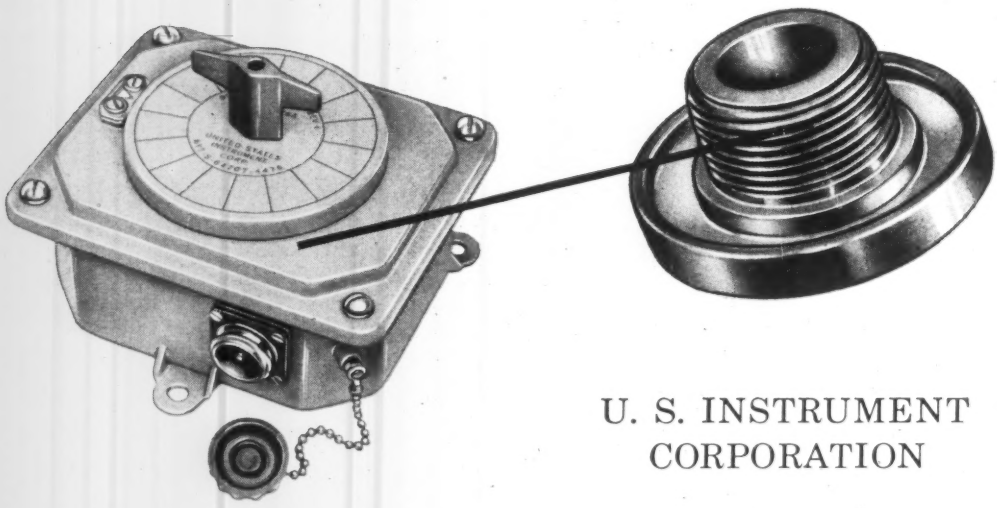
Three more nationally known manufacturers select Mueller Brass Co. Forgeable Bearing Alloys for vital components of their products

In ever-increasing numbers, Mueller Brass Co. specialized alloys are being specified by manufacturers of top-quality products. In a series of continuing advertisements, we have presented case histories of successful applications, to which we now add three more distinguished companies who are incorporating Mueller Brass Co. forgeable bearing alloys in their products to meet the demands of widely divergent operating conditions.



U. S. INSTRUMENT CORPORATION

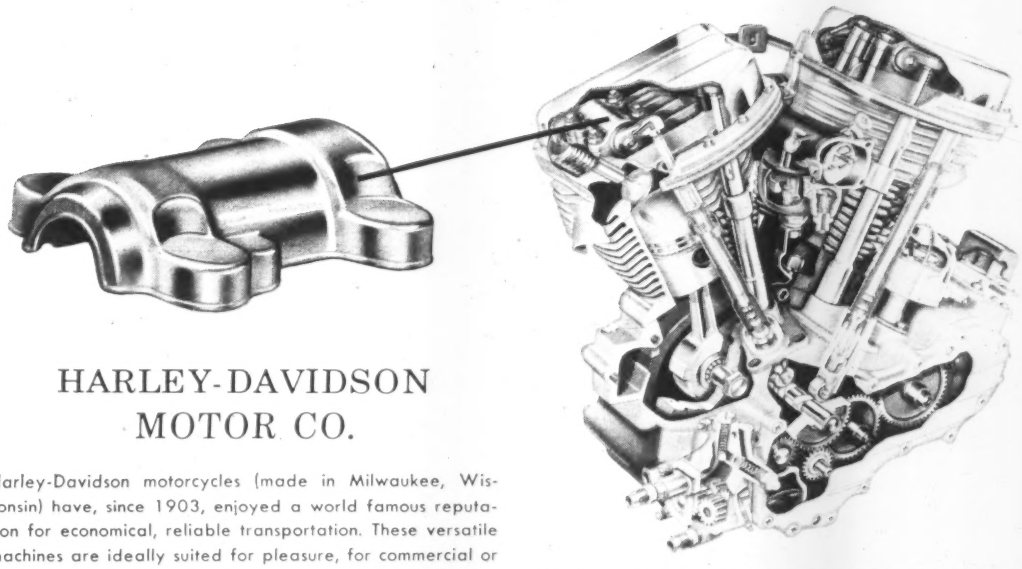
U. S. Instrument Corporation, Charlottesville, Va., selected abrasive-resistant Mueller bronze alloy bushings for their remarkable telephone selector switches after exhaustive tests of many materials. A vital communications link on today's U. S. Naval vessels, these sound-powered telephone circuits must meet rigid Navy performance-standards. Such phones, for example, must have selector switches which are capable of rotating for a minimum of 50,000 torturous cycles . . . 360° clockwise, followed by 360° counter-clockwise. In addition, the "O" ring must still form a water-tight seal AT THE END OF THE TEST! Of the many tested, a Mueller Brass Co. special manganese bronze alloy was the best one meeting these rigid specifications.

There were other important reasons why these bushings were chosen by U. S. Instrument Corporation for this application. Resistance to abrasive action against the rubber "O" ring was a prime one . . . then, too, the stem assembly suffered severe pounding through the action of the indexing mechanism which, prior to the use of the Mueller Brass Co. alloy, caused repeated seizure of the component parts. In this particular application, the part was fabricated on an automatic screw machine rather than produced as a forging. The versatility of Mueller Brass Co. alloys makes them readily adaptable to the most economical method of fabrication dependent upon the size, shape, and end-use requirements of the part.

In commenting on the success of this part, U. S. Instrument Corporation praised the alloy for its tensile strength (ordinary brasses could not withstand the 2000 ft. lb. impacts without deformation), for its machinability and corrosion-resistance.

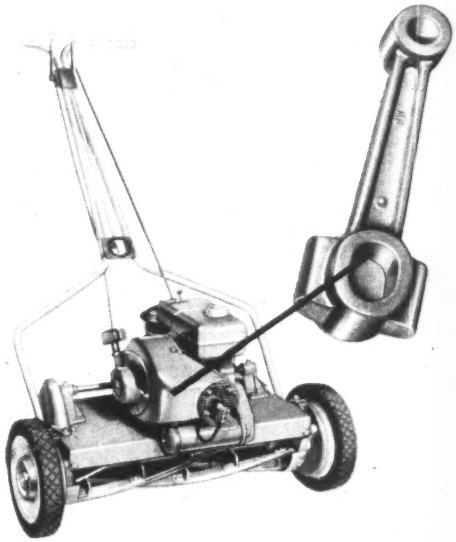
40 MUELLER BRASS CO.

MUELLER BRASS CO.



HARLEY-DAVIDSON MOTOR CO.

Harley-Davidson motorcycles (made in Milwaukee, Wisconsin) have, since 1903, enjoyed a world famous reputation for economical, reliable transportation. These versatile machines are ideally suited for pleasure, for commercial or business use, as well as the grueling demands of law enforcement work. Harley-Davidsons boast a dependable engine . . . one which can roll up an astounding mileage record with little or no care. The painstaking selection of every engine component is one important reason for this reliability. The new twin-cylinder Harley-Davidson 74 OHV employs Mueller Brass Co. bronze alloy forgings in the form of rocker-arm bearing caps. Subjected to violent temperature changes, fast starts and stops and road shock, Mueller forgings are proving again and again that they have the ability necessary to withstand almost any punishment . . . and still provide unfailing service.



JACOBSEN MFG. CO.

Jacobsen Mfg. Co., Racine, Wisconsin, was among the first to produce a practical power mower for home use. That was more than 35 years ago! Today, Jacobsen power-mower dependability is evident itself in more than a dozen gleaming new models such as the popular Pacer, Lawn Queen, Manor and others. One of the most reliable components in the always dependable Jacobsen hi-torque engine is a Mueller Brass Co. connecting rod forged from special bronze alloy. Jacobsen mowers with Mueller-forged connecting rods are called upon by some commercial users to operate as much as 8 hours daily, 6 days a week . . . perhaps as much as 2000 hours a year. In searing summer temperatures, thru hours of constant operation, the high uniform strength of Mueller bronze forgings constantly withstands pounding and vibration with the same conspicuous success as in its many other applications.

Why not investigate these specialized alloys for your own products. We welcome your inquiries. Our engineering staff will be happy to make specific recommendations. Both on the proper alloy and the best method of fabrication to meet your needs . . . exactly. Our engineering manuals show many, many examples of how American manufacturers have used these alloys to great advantage.

• WRITE TODAY FOR THE ENGINEERING MANUAL YOU NEED

Mueller Brass Co. Forgings
Engineering Manual H-58565 ☐

Tuf Stuf Aluminum Bronze Alloys
Engineering Manual H-58563 ☐

"600" Series Bearing Alloys
Engineering Manual FM-3000 ☐

Copper Base Alloys in Rod Form
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you can get this brilliant finish directly on zinc die castings!

No electroplating--no mechanical finishing!

PART AS CAST

TREATED WITH NEW IRIDITE

NEW IRIDITE® (Cast-Zinc-Brite)

brightens zinc die castings by chemical polishing, protects against corrosion

NOW, FOR THE FIRST TIME you can get a brilliant, decorative finish directly on zinc die-cast parts . . . without mechanical finishing, without electroplating! The luster is provided by the *chemical polishing* action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been *tested and proved* in production.

CORROSION RESISTANCE, TOO! New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

AS A BASE FOR ELECTROPLATING—Lower mechanical finishing costs are possible where plated finishes are *required* since the brightness provided by this new Iridite may be sufficient.

LET US SHOW YOU what Iridite (Cast-Zinc-Brite) can do for you. Send us at least a half-dozen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. *IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.*

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Failures by Division of Industry

(Current liabilities in millions of dollars)	Number 8 Months 1957	Number 8 Months 1956	Liabilities 8 Months 1957	Liabilities 8 Months 1956
Mining, Manufacturing	1594	1609	138.3	130.8
Mining—Coal, Oil, Misc.	40	27	6.8	6.4
Food and Kindred Products	120	143	8.2	8.4
Textile Products, Apparel	342	393	21.7	25.4
Lumber, Lumber Products	322	265	17.3	15.6
Paper, Printing, Publishing	87	89	5.7	6.5
Chemicals, Allied Products	44	41	3.9	11.2
Leather, Leather Products	49	64	5.5	3.8
Stone, Clay, Glass Products	40	24	1.8	3.0
Iron, Steel and Products	71	86	23.9	8.5
Machinery	166	195	17.5	21.8
Transportation Equipment	47	36	4.6	2.8
Miscellaneous	266	246	21.4	17.5
Wholesale Trade	831	844	51.1	55.6
Food and Farm Products	193	195	13.1	8.7
Apparel	31	35	2.2	1.7
Dry Goods	20	34	0.8	1.0
Lumber, Bldg. Mats., Hdwre.	96	109	5.5	15.8
Chemicals and Drugs	35	32	1.4	1.0
Motor Vehicles, Equipment	49	48	2.7	2.8
Miscellaneous	407	391	25.5	24.6
Retail Trade	4743	4314	127.3	105.6
Food and Liquor	760	720	15.5	11.6
General Merchandise	204	195	8.7	7.8
Apparel and Accessories	800	821	16.2	17.0
Furniture, Furnishings	705	529	26.6	18.7
Lumber, Bldg. Mats., Hdwre.	328	258	9.6	7.6
Automotive Group	564	477	13.3	16.1
Eating, Drinking Places	771	790	18.0	16.2
Drug Stores	197	106	4.9	2.4
Miscellaneous	414	418	14.5	8.3
Construction	1397	1152	77.6	62.6
General Bldg. Contractors	538	428	44.0	33.4
Building Subcontractors	777	660	26.5	26.2
Other Contractors	82	64	7.1	2.9
Commercial Service	728	696	29.9	28.6
Total United States	9293	8615	424.2	383.2

Liabilities are rounded to the nearest million; they do not necessarily add to totals.

While fewer food and apparel stores and restaurants failed, tolls climbed in appliance and automotive lines. All construction's upturn from the previous month occurred among general builders.

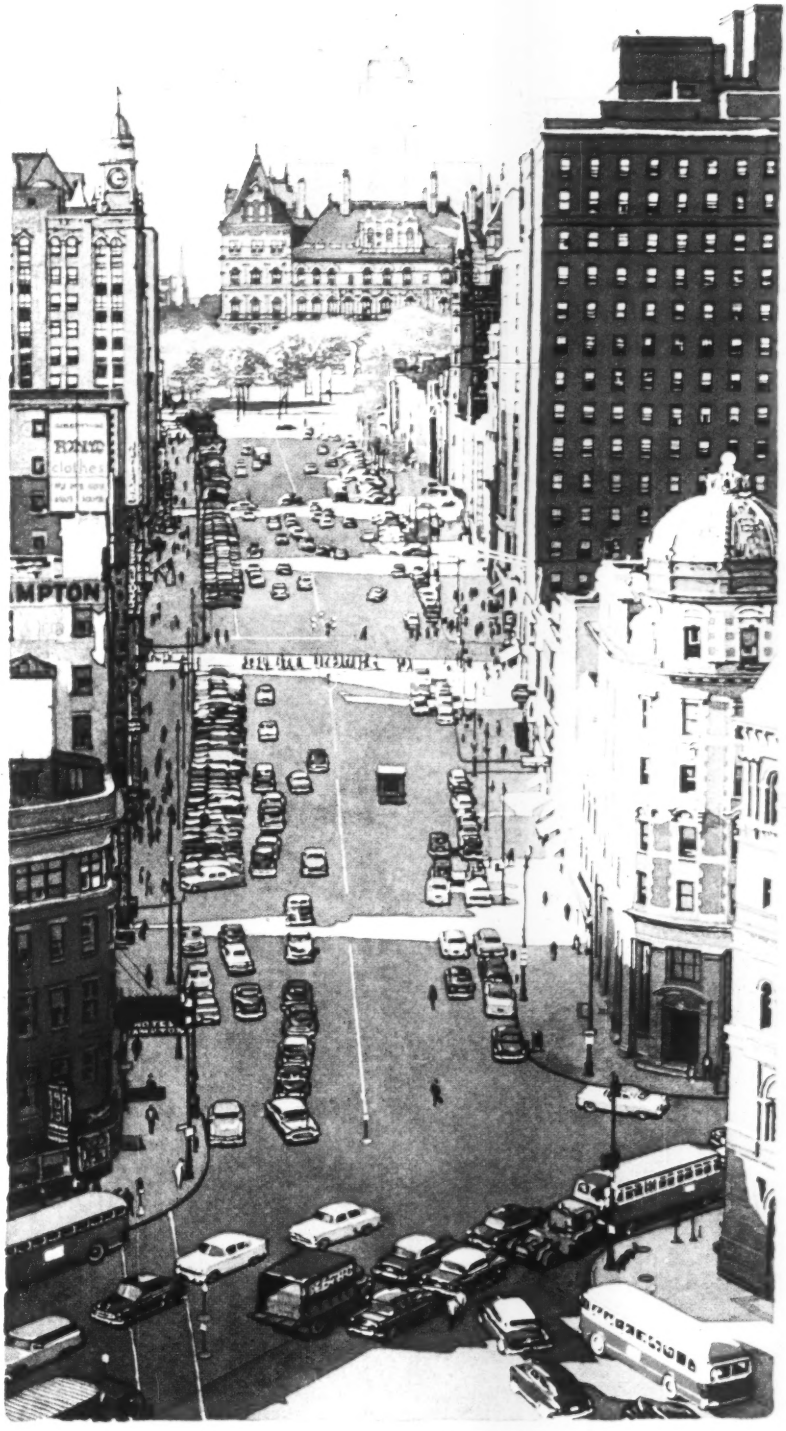
Manufacturing, retailing, and construction casualties climbed above last year. Tolls were higher for manufacturers of lumber, chemicals, transportation equipment, offsetting declines in iron and steel, printing and publishing. Furniture, appliance, and automotive casualties raised the retail total above a year ago despite dips from 1956 in many lines. Neither wholesaling or commercial service had as many failures as last August.

In all geographic regions except one, total casualties in the first eight months of 1957 ranged above the comparable period of a year ago (see chart on page 13). But, August-to-August comparisons reveal mixed trends. Five regions suffered more failures and four had less. Tolls rose considerably in the East South Central, West South Central and Pacific States. Non-metropolitan districts accounted for all the upswing.

This report was prepared in the Business Economics Department, Dun & Bradstreet, Inc., by Rowena Wyant.

"UPSTATE, N.Y."

RONALD McLEOD

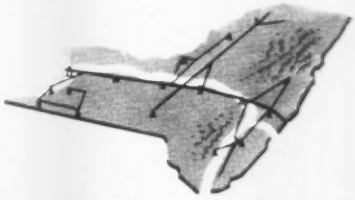


WOULD YOU like to locate a factory to get fast, cheap distribution . . . outstanding research facilities...highly skilled labor? Would you like to set up offices to serve rich markets you now miss?

Come to Upstate New York's Tri-City area of Albany, Schenectady and Troy. This thriving manufacturing and trading area offers a complete choice of transportation: railroads, airlines, the Barge Canal, the new Thruway and the deep-water Hudson River.

The area bustles with atomic and electronic research activities. Its universities are famous for engineering and science.

And throughout "Upstate, N. Y." you'll find plenty of low-cost electricity and natural gas. For more about successful "Upstate, N. Y.", write Earle J. Machold, President, Niagara Mohawk Power Corporation, Syracuse, N. Y.

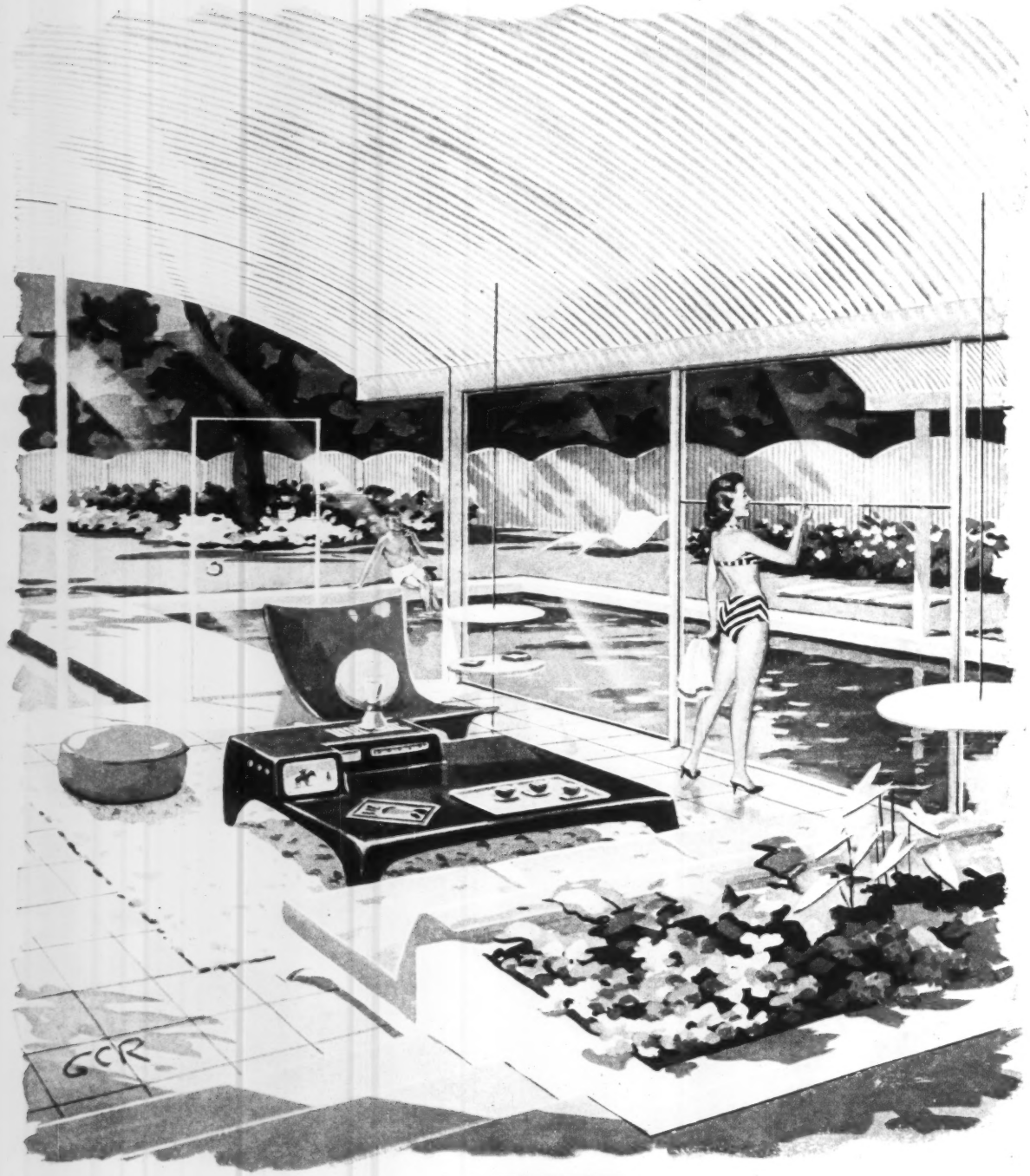


Typical of the thriving, busy cities of Upstate New York is Albany, the State Capital (left). More and more firms are expanding in Upstate New York. One of many reasons is the new Thruway which flows through the heart of the Niagara Mohawk System.

powered by NIAGARA MOHAWK

NIAGARA MOHAWK

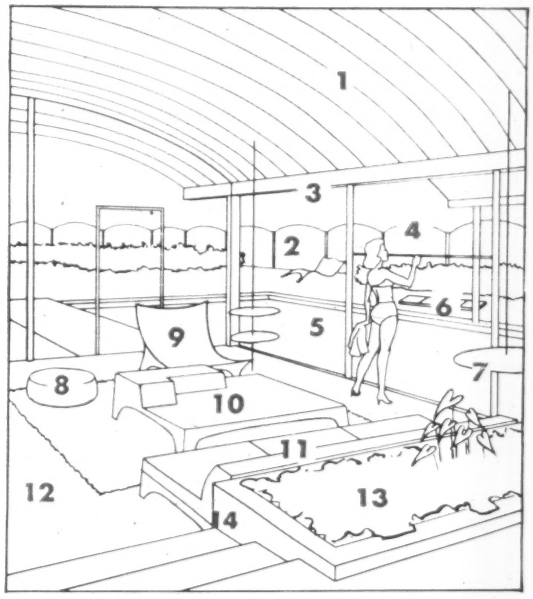
From BAKELITE'S



GEORGE COOPER RUDOLPH, AIA,
who conceived this modern interior, states, "There is virtually no limit to the imaginative use of plastic materials—to make more functional, yet attractive and livable homes."

many different plastics come...

Modern Materials for Modern Living



Here's imaginative use of plastics! **1** Neat, clean, and self-supporting, the roof is made of reinforced plastic curved for strength. Light is pleasantly diffused. The same material also provides a colorful, lightweight fence **2** easily shaped with ordinary tools. **3** Air conditioning ducts are strong, lightweight, corrosion-resistant sandwich panels of phenolic foam between reinforced epoxy skins. **4** Sparkling transparent biaxially-oriented styrene film rolls up like a window shade. The swimming pool **5** is built of foundation material lined with a colorful and durable pool liner of vinyl film. **6** Colorful cushions covered with vinyl upholstery take plenty of wear, resist sun and cleaning agents. **7** Strikingly simple lighting fixtures use a combination of phenolic and styrene plastics for unusual effects. **8** Upholstered hassock has a one-piece vinylfoam core with durable, integral skin of colorfast vinyl. **9** Contour chair of reinforced plastic cleans easily, resists chipping, scratching. **10** Integrally molded phenolic table is stain- and scratch-resistant, features color television, and built-in electric hot plate. **11** Couch covered with vinyl fabric permits dramatic texture effects without problem of fragile fabrics. Vinylfoam core keeps shape and provides maximum comfort. **12** Flooring of tough, colorful vinyl tiles resists scuffs, soil, alcohol, cleansing agents, is easy to keep clean. **13** Flowers and vines planted in polyethylene pots maintain their attractiveness for a long time and a film liner of polyethylene keeps moisture in the planter. **14** Exterior of planter is protected with a vinyl masonry paint that resists moisture and wear.

DID YOU KNOW that the printed or plated circuits required in miniature radios and other electronic equipment are made on strong, reinforced sheets based on BAKELITE Phenolic Resins.

A famous designer visualizes how you could build tomorrow's home with the versatile plastics of today.

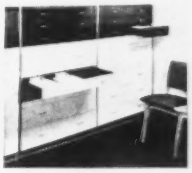
Designs take new forms, products new color, new durability, new freedom from care . . . and new customer appeal when the advantages of BAKELITE Brand Plastics are applied with imagination and skill.

One key to design ingenuity is the selection of the plastic with properties best suited to the job. At Bakelite Company, you will find vinyls, phenolics, styrenes and impact styrenes, polyethylenes, epoxies and silicones . . . the greatest variety available to fill the most discriminating requirement.

But matching materials to the job is only part of the answer. Bakelite Company's vast knowledge and years of experience in the field are the extra measures that can help you make and market a better product—for business, industry, or the home.

Ceilings take on new importance when they glow with soft, warm light. Translucent panels of BAKELITE Rigid Vinyl Sheet can transform your ceilings into an attractive light source. Lightweight and durable for easy cleaning. They are permanent and they resist discoloration, moisture, and most chemicals.

A rainbow by the gallon! New interior wall paints based on BAKELITE Vinyl Latex are famous for their wide range of hues, easy application, permanence. They are easily stored, give a tough finish that can be scrubbed only a few hours after application. Manufacturers find them easy to formulate, too.



Dramatize storage space with drawers molded of BAKELITE Phenolic Plastic. They're rigid, easy-to-clean, and one piece, unaffected by heat or humidity. A range of sizes allows you to design almost any shape storage area . . . room divider, desk, bureau, merchandise rack. They're exceptionally easy to install.

A leader in the world of plastics...

BAKELITE
BRAND
PLASTICS

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation*, 30 East 42nd Street, New York 17, N. Y.

The terms BAKELITE, UNION CARBIDE and the Trefoil Symbol are registered trade-marks of UCC.

Get a Hertz Charge Card—right now!

Enjoy the advantages of one of the most respected of all charge cards. Fill in the application attached to this page. Your Hertz International Charge Card—entitling you to no-deposit and charge privileges on business or pleasure trips in over 900 cities throughout the world —will be mailed to you promptly.

Take advantage of this free offer. Then you, too, will enjoy all the advantages of having your own Hertz Charge Card!

Rent the kind of car you like to drive. Then "charge it!" Save time on business trips—have more fun on vacations. Show your Hertz Charge Card and driver's license at any of more than 1,350 Hertz offices—you can rent a sparkling, new Powerglide Chevrolet Bel Air or other fine car.

Act now! Get your Hertz Charge Card. Take a minute and fill in your application right away! Or, if you would like company-authorized charge cards for your employees, in which case rental charges incurred are billed to the company instead of to the individual, use the company form on the reverse side of the application at the right. Mail applications to: Hertz Rent A Car, 218 South Wabash Ave., Chicago 4, Ill.

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(Personal Application)

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PLEASE PRINT, THEN MAIL TO: HERTZ SYSTEM, 218 SOUTH WABASH AVE., CHICAGO 4, ILL.

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Res. Address _____ City _____ State or Province _____ Years Residing At This Address _____ Rent Home ☐ Own Home ☐

Employer or Firm Name _____ Position _____ Years With Present Employer _____ Years in Position _____

Business Address _____ City _____ State or Province _____ Annual Income/ Under $5000 ☐ Over $5000 ☐ Over $6000 ☐ Over $7500 ☐

Bank Reference _____ Type of Account _____

Branch or Street Address _____ City _____ State or Province _____

National Credit Card—Co. _____ # _____ Expires _____

National Credit Card—Co. _____ # _____ Expires _____

Driver's License—State _____ # _____ Expires _____

Present HERTZ Card No. _____ Enclosed ☐ Lost ☐ None ☐

SEND INVOICES TO: Business Address ☐ Residence Address ☐

I understand that if this application is approved, all charges made through use of Hertz Personal Charge Card are payable on or before the end of the month in which charges are incurred, and to the office issuing the invoice.

APPLICANT'S SIGNATURE _____ Date _____

DUN-10-57

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Fill in the application attached—tear off, and mail at once to HERTZ RENT A CAR, 218 South Wabash Ave., Chicago 4, Ill. Your card will be sent to you promptly—as quickly as approved.

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The Hertz International Charge Card entitles you to no-deposit and charge privileges on business or pleasure trips. It is a permanent card and is honored in every Hertz office—more than 1,350 in over 900 cities throughout the world. Rental charges are billed to the holder and payment is made to the office issuing the invoice, in the currency of that office's nation.

Show your Hertz International Charge Card and driver's license and rent the kind of cars you like to drive—new, sparkling Powerglide Chevrolet Bel Airs or other fine cars. All in finest condition. Cleaner, more dependable. The national average rate is only $7.85 a day plus 8 cents a mile (lower by the week). That includes all gasoline, oil and proper insurance.

Save time on business trips—have more fun on vacations. To be sure of a car at your destination—anywhere—use Hertz' more efficient reservation service. Call your courteous local Hertz office. We're listed under "Hertz" in alphabetical phone books everywhere!

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(Company Application)

FOR PERSONAL CARD—USE REVERSE SIDE

PLEASE PRINT. THEN MAIL TO: HERTZ SYSTEM, 218 SOUTH WABASH AVE., CHICAGO 4, ILL.

Firm Name

Billing Address Type of Business

City Zone State

Headquarters City of Firm

Do You Now Have Hertz Company Charge Cards Yes ☐ No ☐ Account No.

Please furnish us with HERTZ International Charge Cards in the name of our Firm for use by the individuals listed below and others whom we may authorize to receive cards at a later date. The holders of these cards will be permitted to charge automobile and truck rental service to our account. All charges incurred will be paid promptly by us to office rendering invoice.

Issuance Approved by

Signature of Owner or Officer

Position Date

Name of Employee to Receive Card	Height	Color of Eyes	Do Not Use This Space

Bank Reference

Address

Additional Bank or Other References

FOR ADDITIONAL CARDS provide above information for other employees in a letter on company stationery and signed by an authorized official. Attach to this application.

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Fill in this application for Company-Authorized Hertz International Charge Cards

(For a personal Hertz International Charge Card, use the application on the reverse side)

Fill in the application attached—tear off, and mail at once to HERTZ RENT A CAR, 218 South Wabash Ave., Chicago 4, Ill. If you wish to submit the names of additional employees, attach a list to the application. Your Company-Authorized Hertz International Charge Cards will be sent to you promptly—as quickly as approved.

Get more done on business trips with Company-Authorized HERTZ International Charge Cards

Company-Authorized Hertz International Charge Cards provide the same privileges as individual charge cards . . . except that rental charges incurred by the user are billed to the company authorizing issuance of the cards, instead of to the individual. This is a convenience to the employer to maintain an accurate record of transportation costs.

More businessmen by far use Hertz. They leave their cars at home, get to their destination quickly and comfortably by plane or train, then rent a Hertz car there. You save valuable time, make more business calls, cover a greater territory, and get back home sooner. And now, Hertz "Rent it here . . . Leave it there" service is available nation-wide at no extra charge! (Between Hertz cities on rentals of $25 or more. For Chevrolet Sedans and comparable models only.)

Employees need only show a Company-Authorized Hertz International Charge Card and driver's license to rent a bright, new Powerglide Chevrolet Bel Air or other fine car. The national average rate is only $7.85 a day plus 8 cents a mile (lower by the week). That covers all gasoline, oil and proper insurance. Call Hertz to reserve a car . . . anywhere!

VOICE OF INDUSTRY

North River Rail Yards, New Jersey—Devaney Photograph

- ***Profit opportunity in materials management***
- ***Making "waste products" pay***
- ***Curbing the wage-cost spiral***
- ***Tax relief for business profits***

MATERIALS MANAGEMENT: PROFIT OPPORTUNITY

D. S. HARDER, *executive vice president, Basic Manufacturing Divisions, Ford Motor Company, before the Society of Advancement of Management.*

Materials management . . . is still a new and challenging field calling for the unlimited application of new ideas. The object will be to find the right combination of talent and equipment which will afford a continuous production flow from the source of raw materials, through manufacture, and ultimately into the hands of the customer, with a minimum of human effort. . . .

Five years ago I remarked that in the handling, storing, packaging, and transporting of materials lies one of our greatest opportunities for industrial progress. I have not changed my mind. The opportunities are still there. It is in the manufacturing fringe areas, such as the indirect labor categories, that cost reductions offer a wide latitude for improvement. . . .

Materials management can be an important management tool only if it is properly planned. . . . Good planning starts with product design. Materials management people must have early knowledge of design and participate in basic planning for manufacture. At Ford this review at an early stage has been augmented by the use of plastic prototypes, which are usually made by vacuum forming a thermoplastic material. The prototypes allow examination of actual conditions as they appear on the finished product. This permits rapid translation of ideas on alternate methods of shipping and handling, as well as on manufacture.

I feel there should be greater coordination of design and manufacturing engineers in the materials management of the future. It does little good to have a product which is the designer's delight if it cannot be economically tooled, or if it costs a small fortune to protect and ship. This is a practical matter which has not been given sufficient attention. The handling engineer is given a finished product and told to handle and ship it. He will do it all right, but it is a thankless job and the cost is unreasonable.

Recent developments in our company have decentralized product engineering so that the design and manufacturing people are now placed under one management, which is charged with the responsibility of producing and selling particular products. This was done to accomplish the integration that appears so vital in economic production. . . .

The materials management system

Your cycle of protection is not complete unless accounts receivable are insured

When a shipment is made—title passes—and you create an account receivable. You are more certain of the end result—PROFIT—when you protect accounts receivable with Credit Insurance. That's why an increasing number of executives have decided that NO cycle of protection is complete unless capital invested in accounts receivable is insured by ACI. To learn more about Credit Insurance, call our office in your city, or write AMERICAN CREDIT INDEMNITY COMPANY of New York, Dept. 50, 300 St. Paul Place, Baltimore 2, Maryland.

Liquidity of capital is the prime responsibility of management. Protect your working capital invested in accounts receivable with

American Credit Insurance

of the future calls for integration. It should be as much a part of the plant layout as in-line machine placement, and it should be given as much attention as anything on the layout. The system must be flexible so that it can be adapted to changing conditions. The in-process automation must be coordinated with collateral mechanized handling. The construction of facilities, such as docks, ramps, and storage areas, should be dictated by standardized handling equipment and methods.

The interchangeability concept should never be out of sight. And interchangeability is a by-product of standards. There should be extensive communication of the handling plan to everyone connected with it. . . .

The broad scope of materials management still represents the most fertile field for increased productivity.

HOW TO MAKE "WASTE PRODUCTS" PAY

VICTOR CONQUEST, *vice president, Research Division, Armour & Co., at the National Industrial Research Conference.*

The very idea of waste is distasteful . . . to American industry. . . .

A "waste product" is a material that *temporarily* has no known good or valuable use. This is a *transitory* state because sooner or later the incentive will occur that will encourage the owner of such a product to upgrade it through research and technology to the status of a by-product, having a more valuable use, or all the way to a main or key value product.

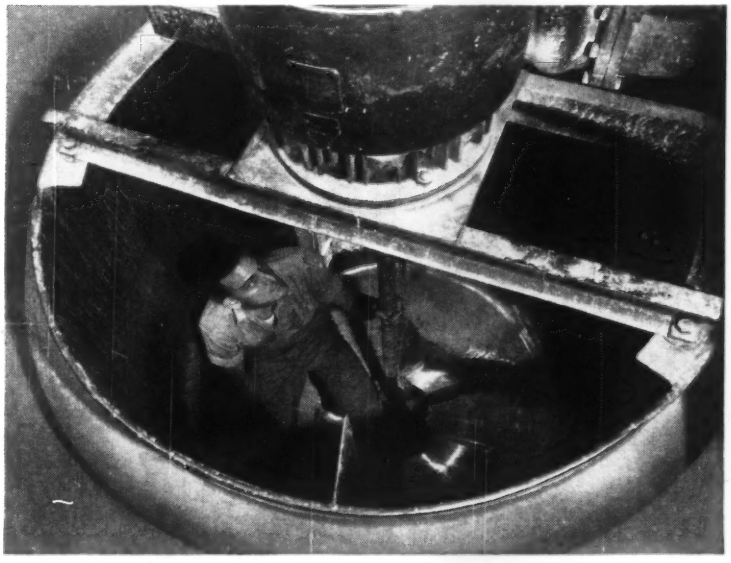
Most present-day "by-products" were, at one stage in their histories, "waste products."

The incentives that cause the owners of "waste products" to try to change their use and designation as "by-products" are many, but most compelling is the economic reason. . . .

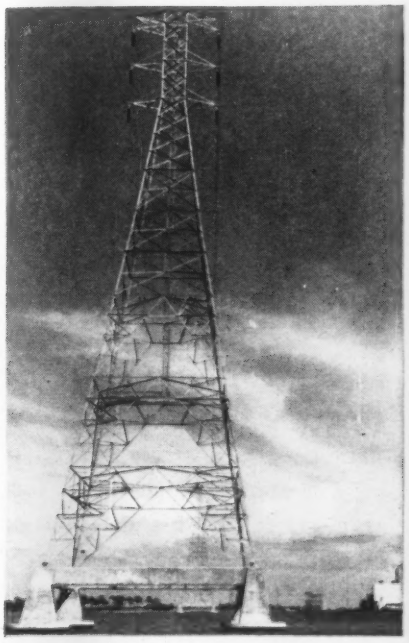
Where no action is being taken to upgrade a "waste product" to a "by-product" or better status, it is usually traceable to lack of a plan or time to get at the job. Where there is complete indifference to a waste

Only STEEL can do so many jobs so well

Operation Deep Freeze. Last year, to prepare Antarctic base sites for the present International Geophysical Year, U. S. Navy Task Force 43 made an almost complete circle around Antarctica. Lead vessel was the USS Glacier, powerful pride of the Navy's icebreaker fleet. In this startling picture, the Glacier pokes her tough steel nose into the desolate Atka Bay ice barrier so that scientists and Navy men can reconnoiter and plant the American flag.



The Finest Printing is Done on Clay. High-gloss papers (called enamel-coated) are covered with a thin coating of smooth, hard, lustrous clay to keep printing inks from being absorbed into the paper fibers. That clay is mixed in tanks like this one. Tanks are stainless steel because nothing else can withstand the grinding action of the clay and at the same time keep it pure and white. In fact, this stainless tank has lasted seven times as long as the previous non-stainless tank.



High Line At Low Cost. These gigantic electrical transmission towers are 198 feet high—because they must provide 100 feet of clearance for ships passing underneath in Old Tampa Bay, Florida. By using a special USS MAN-TEN High Strength Steel, 6½ tons were trimmed off the weight of each tower. The total money saving for four towers amounted to $7,200 . . . far more than the slight extra cost of the high strength steel. Another job well done with steel!

UNITED STATES STEEL

American Bridge . . . American Steel & Wire and Cyclone Fence . . . Columbia-Geneva Steel
Consolidated Western Steel . . . Gerrard Steel Strapping . . . National Tube . . . Oil Well Supply
Tennessee Coal & Iron . . . United States Steel Homes . . . United States Steel Products
United States Steel Supply . . . **Divisions of United States Steel Corporation, Pittsburgh**
Union Supply Company · United States Steel Export Company · Universal Atlas Cement Company

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Watch the **United States Steel Hour** on TV every other Wednesday (10 p.m. Eastern time). 7-2229

The Rajah says:

"Hurrah for *KLM* Air Cargo"

A sweltering Rajah decided one hot day to trade one of his old emeralds for a brand new air conditioner. To his joy, the local distributor for the American manufacturer had just the right model. Seems the distributor always specifies KLM Air Cargo. He orders in frequent small lots, so he always has the latest models on hand, saves on capital tied up in merchandise in transit. As for the Rajah, he had his air conditioner installed the same day and has been wonderfully cool ever since.

Serving Europe, the Near, Middle and Far East, South Africa and the Americas

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SEE YOUR CARGO AGENT, FORWARDER or any KLM office for information and rates on your particular commodity. KLM Royal Dutch Airlines, 250 Pearl St., N. Y. 38, N. Y. WHitehall 4-3480.

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ROYAL DUTCH AIRLINES

problem, that industry is not fulfilling its mission in our economy and may find the going rough as competitors do pay attention to and solve such problems. . . .

Here are some of the steps we need to take once a "waste product" is made:

First, do what we can to evaluate its possible uses in foreseeable ways as it exists, with a minimum of processing.

The second step leading to new and novel products is to learn all about the "waste product" as to its chemical structure, physical characteristics, and its reactivity under all conditions of temperature, pressure, and environments. This step is basic to extending and expanding its possible uses. This is where the research team contributes to the solution of the problem.

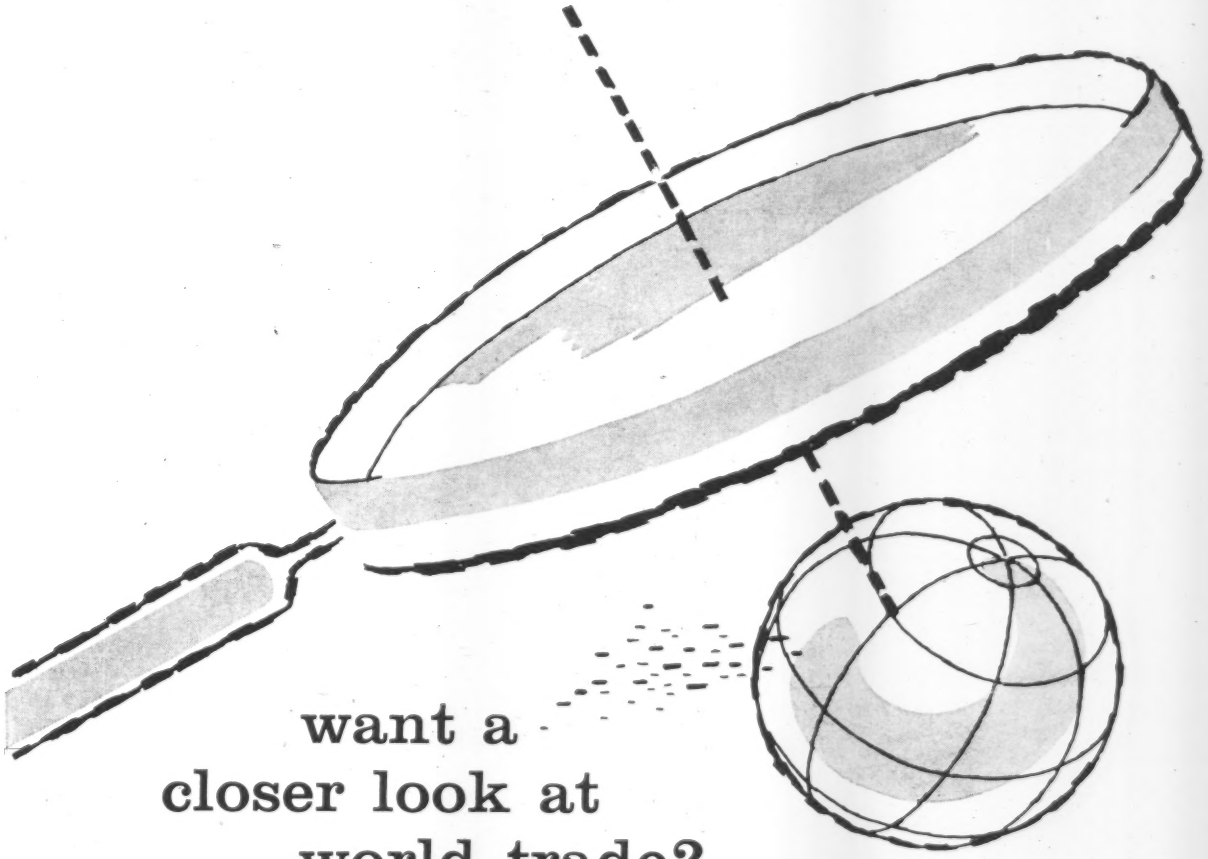
The third component needed to solve the problem is creative and unrestricted thinking for the development of ideas concerning all aspects of the material and its derivatives and uses for them. Follow up the ideas developed and work them through to a conclusion. Handled on this scientific basis, any "waste product" problem will be solved.

FACING INFLATION'S LONG-RANGE THREAT

ROY L. REIERSON, *vice president, Bankers Trust Company, at the 27th National Business Conference of the Harvard Business School Association.*

Business in the past two years has come to learn with increasing emphasis that inflation is not the unmixed blessing superficially indicated by rising dollar figures for sales and, occasionally, for profits. Business has found its requirements for funds enhanced substantially by mounting costs of plant and equipment, larger investment in inventories, and growing receivables. . . . Unless the sustained rise of costs and prices can be brought under control, the pressures on savings, on credit, and on business liquidity could well become chronic.

There is obviously no easy way to check the wage-cost-price spiral.



want a closer look at world trade?

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Thanks to better communications and faster transportation, our world is getting smaller every day. Events move swiftly, making accurate, up-to-the-minute information more vital than ever. Chase Manhattan service is notable for its speed and thoroughness.

Through the Chase Manhattan International Department, you have at your service a world-wide network of correspondent banks totaling more than 51,000 banking locations. Wherever in the world you have trade problems or opportunities, we think you will find it good business to

"talk to the people at Chase Manhattan."

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Offices of Representatives:
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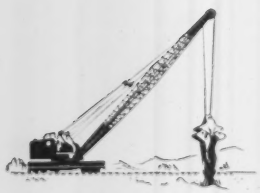
THE
CHASE MANHATTAN
BANK
HEAD OFFICE: 18 Pine Street, New York 15, N. Y.
Member Federal Deposit Insurance Corporation

portrait of an executive

...with Rocks in his head

This man has the problem of moving rocks and ore in and out of railroad cars and river barges, lake boats and ocean vessels. The more he analyzes his costs and his time sheets, the more convinced he is that Industrial Brownhoist cranes save him money.



Since 1877 Industrial Brownhoist has been solving the heavy materials handling problems of steel mills, railroads, scrapyards and others.

Each and every Brownhoist Crane operates with magnet, hook or bucket. They are available in capacities from 25 to 250 tons. For complete information consult your nearest Brownhoist representative or write us today.

Our nearest representative knows how to help you. Or write direct to Bay City, Michigan.

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AGENCIES: Detroit, Birmingham, Houston

BROWNHOIST

Gradually, however, business may find itself compelled in its own self-interest to become less tolerant of rising costs and prices than in recent years. This would seem to require taking a firmer stand than heretofore against the practice of large annual wage increases, which in many industries have been running well in excess of gains in productivity. . . .

If, either out of complacency or concurrence, we continue to accept the repeated turns of the inflationary spiral, there is every probability that inflationary pressures will gain cumulative strength. In that event, we shall have exchanged the promise of sustained economic growth in the years ahead for a highly dubious and insecure future.

PROPOSED: A DEFERRED TAX ON NEW PROFITS

D. S. MOFFITT, *vice president, The Connecticut Hard Rubber Co., special to DR&MI.*

A sound graduated corporate income tax that does not unduly penalize "big" business or decrease Federal revenue is practicable. One way would be to exclude from taxation that part of a corporation's earnings that exceed the earnings recorded for any previous year. In other words, any increase in earnings over a previous high year would be tax-free.

Such a plan would help growing small concerns finance their growth. It would be an incentive to increase earnings by increasing the productivity of corporations of all sizes. This increased productivity would help to offset the wage inflation brought on by contractually guaranteed annual wage increases. Such a plan would also help to rid the economy of such unproductive expenditures as lavish entertainment, which has been tolerated only because of high taxes.

The revenue loss to the Government would be negligible because only the *increase* in profits would be tax-free. Any increase in revenues due to an expanding economy would only be put off for one year under this proposed scheme.

Planning a new building?...Check these unique features of Armco Steel Buildings

- ☐ Low cost
- ☐ Precision-made, factory-engineered parts
- ☐ Save preliminary design work
- ☐ Quickly erected — "move-in" time reduced
- ☐ Erection service available
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- ☐ Buildings from 28 to more than 100,000 sq. ft. — clear span widths from 5 ft. 4 ins. to 100 ft.
- ☐ Building tailored to your *exact* space needs
- ☐ Attractive, modern appearance
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- ☐ Nothing to rot, warp or crack — practically no maintenance
- ☐ Available in corrosion-resistant zinc- or aluminum-coated steels, or mill-prepared for immediate painting
- ☐ Noncombustible and lightning-safe
- ☐ Easily and rapidly modified or enlarged
- ☐ Interiors simple to insulate or completely finish

Before you make a decision on your building needs be sure to get the full story on Armco Steel Buildings.

For complete information, **call Western Union and ask for Operator 25** or mail the coupon.

Armco Drainage & Metal Products, Inc.
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Send information on Armco Steel Buildings for the following uses:

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Name _____
Company _____
Address _____
City _____ *Zone* _____ *State* _____

ARMCO STEEL BUILDINGS

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It took a city-wide election

We found an ideal site for this company's proposed new distribution center. The only difficulty was that it lay just outside the city limits, in a rural township that could not provide sewerage, water, or fire and police protection. Chesapeake and Ohio's Industrial Development Department went to work.

The only way these services could be made available was by annexation of the township by the city. First the Mayor, the City Manager and the City Industrial Committee had to be won over to the plan. Then it had to be approved by a city-wide referendum. The election was arranged. The desirability of the new industry was sold to the public, and the annexation was overwhelmingly approved.

Finding just the right site for a plant is seldom a simple matter. Often there are intricate negotiations which can best be handled by a third party; in this case the C&O.

When you bring your plant location problem to the Industrial Development Department of Chesapeake and Ohio, you are enlisting the aid of a team of experts in every phase of the subject—including marketing, transportation, raw materials, taxation, labor, water and geology.

We know you will be pleasantly surprised at the amount of help this organization is able to give you.

Write for new booklet describing industrial resources and opportunities in C&O territory. Address: Wayne C. Fletcher, Director of Industrial Development, 3203 Terminal Tower, Cleveland 1, Ohio.

Chesapeake and Ohio Railway

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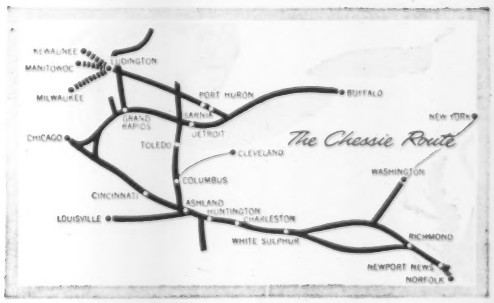

Can you build the plant you need

and still conserve working capital?

Are high building costs forcing you to delay needed building, or to compromise the size, efficiency and profit making ability of the new plant you are planning . . . the plant you need?

There is a way you can build without delay and without compromise. In fact, pre-engineered Butler buildings offer you advantages over more costly, traditional buildings that can help you earn more profits per dollar invested.

Clear-span interiors give you unobstructed floor space for efficiency, flexibility in planning production areas. Truss-free over-head space provides room for economical installation of utilities and materials handling systems.

Your Butler factory gets into production faster, starts making profits weeks, even months sooner because precision-made Butler buildings go up quicker than traditional construction permits.

Pre-engineered for growth, Butler factories can be expanded quickly, easily and far more economically than traditional-built factories.

A Butler factory also provides a healthy, well illuminated and ventilated atmosphere that boosts employee morale . . . efficiency.

Your Butler builder can show you how you can build the plant you need without delay, without compromising productivity and at the same time help you conserve working capital. His name is listed under "Buildings" or "Steel Buildings" in the Yellow Pages of your phone book or write direct.

see our catalog in Sweet's or write for copy

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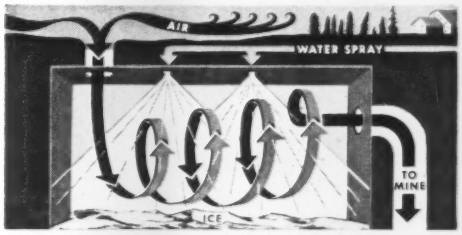
Sales offices in Los Angeles and Richmond, Calif. • Houston, Texas • Birmingham, Ala. • Atlanta, Ga. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. Detroit, Mich. • Cleveland, Ohio • New York City and Syracuse, N.Y. • Washington, D.C. • Burlington, Ontario, Canada

Freezing water to warm a mine

Inco shows a king-size operation that helps mine more Nickel

The bigger the mine, the more men at work, the more *air* they need. Gales of air. Warmed in winter. Cooled in summer. That's the reason for this mammoth "air conditioner" in an Inco-Canada mine.

In winter it raises the temperature of cold air from outside *by making ice.* In summer it uses the ice to cool air that's too hot! (See diagram below)



In winter, cold air is blown through sprays of warmer water. The water loses its heat, freezes into mountains of solid ice. In the process, the latent heat of freezing is transferred to the air, warms it up for use inside the mine.

At full capacity in a winter season, this system alone can generate as much heat as 350,000 gallons of fuel oil. During this period, 150,000 tons of ice may form. (See photo at left)

Installations like this are expensive in time and money. Such outlays are typical of many made by Inco-Canada. Their cost adds up to millions. Results are—to continue the increased production of Nickel.

Mining for Nickel is a 45-minute color film describing Inco-Canada mining methods. Loaned to universities, technical societies, and industry. Write to Dept. 148F,

The International Nickel Company, Inc.
New York 5, N. Y.

INCO

International Nickel

The International Nickel Company, Inc., is the U. S. affiliate of The International Nickel Company of Canada, Limited (Inco-Canada)—producer of Inco Nickel, Copper, Cobalt, Iron Ore, Tellurium, Selenium and Platinum, Palladium and Other Precious Metals.

©1957, T.I.N.Co., Inc.

A mountain of ice, built up in this inside-a-mine "air conditioner." The rock chambers, or "stopes," where the ice forms, are high as a 23-story apartment, big enough to house 300 families. Things have to be done in a big way to get Nickel in the tremendous amounts used by industry to make metals that perform better, longer.

HOW Westinghouse

JOB-TAILORED FLUORESCENT LAMPS MEET YOUR LIGHTING NEEDS

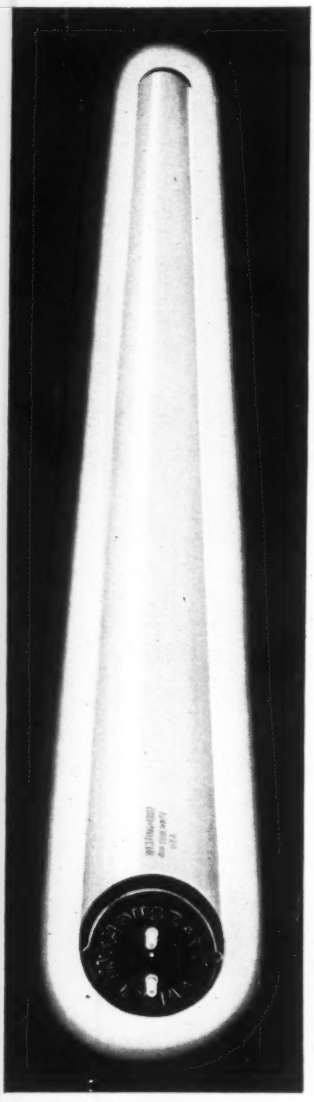
... all with ULTRALUME™ High-Intensity Phosphors • MORE LUMENS PER WATT... more light for your dollar • UNIFORM END-TO END LIGHT • PERFECT COLOR MATCH... ALWAYS • MAXIMUM OUTPUT MAINTAINED THROUGHOUT LONG LIFE

1. New SUPER-HI Fluorescent lamps produce more than twice the light per foot. Designed primarily for high bay (20 feet or higher) industrial and outdoor lighting, a new line of extra high light output fluorescent lamps produce more than twice as much light output per foot as standard fluorescent lamps. The new SUPER-HI lamps permit extremely high energy loading of electrodes, the arc stream and the phosphor. This gives you high light output with new economy at good efficiency and long life.

SUPER-HI lamps are light in weight, convenient to handle and provide a light source subject to the same easy optical control as with present standard T12 lamps, but with over twice the light output. Available in 105, 155, and 205 watts, 4, 6 and 8 ft. The lamps have a rated average useful life of 5000 hours, deliver 6000 to 13,000 initial lumens.

2. High Output Rapid Start lamps give more than 50% more light than regular type. Designed primarily for medium-high bay (15 to 20 feet) industrial and outdoor lighting, four new sizes of Westinghouse high output, rapid start fluorescent lamps can produce over 50% more light than comparable sizes of regular lamps and offer new economy and effectiveness to fluorescent lighting. These lamps provide increased lighting levels, make installations with adequate footcandle values of deluxe color light more practical, and improve the economy and practicability of fluorescent lighting at higher mountings and at lower ambient temperatures.

These lamps are available in 24", 48", 72" and 96" T12 design for general indoor use and for outdoor service where retention of light output at low temperatures is essential. The 72" T12 is recommended for street lighting.



3. Reflector-Fluorescent lamps produce 60% more directed light. For use where external reflectors are difficult or impractical to use, or where dirt deposit cuts lighting effectiveness, these Westinghouse Reflector-Fluorescent lamps provide a directional light distribution which helps put the light where you want it. This is accomplished by a built-in reflecting surface, extending the length of the lamp on the inside of the tube, which redirects about 60% extra light out the other side. Westinghouse Reflector-Fluorescent lamps are recommended for use in coves, showcases and other locations where space is limited. Indirect lighting effects may also be obtained by aiming the lamps toward the ceiling.

They also solve special lighting problems including temporary lighting for construction projects, displays, and exhibits.

Westinghouse Reflector-Fluorescent lamps are available in 40 watt rapid start, 48" and 96" T12 slimline types.

4. Beauty Tone™ Home-line Fluorescent lamps with warm white deluxe color. The same new Westinghouse "Beauty Tone Home-line" lamps which are revolutionizing home lighting by providing warm white deluxe illumination are also ideal for offices, stores and wherever "friendly" color of light is wanted to flatter complexion, enhance the natural color of furnishings, decorations, and displays, and blend well with incandescent lighting.

There's a network of Westinghouse distributors ready to serve you. Call your nearest Westinghouse Supplier for a free Job-Tailored Survey of your lighting requirements. Or write Westinghouse Lamp Division, Bloomfield, N. J.

YOU CAN BE SURE... IF IT'S Westinghouse

Why use a $14.25 crate where a $2.50 skid will do? Ship United!

By taking full advantage of United Air Freight economies, you *save on shipping charges.*

For example: Skid and a crate for this 300-lb. electric motor would cost $14.25. Shipped by expedited surface carrier from New York to San Francisco, total cost is $83.49. Shipping time: 4 to 6 days.

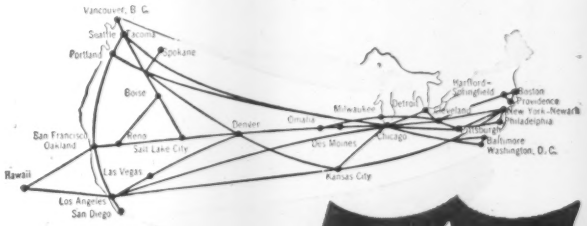
By United Air Freight, the same motor requires skid only ($2.50). Total cost of shipment is $82.30. Shipping time: 24 to 36 hours.

And consider these advantages—DC-7 Mainliner flights and 30,000-lb.-capacity DC-6A Cargoliners coast to coast, Reserved Air Freight (guarantees the space you need on the flight you want), single simplified airbill, other United "firsts."

Examples of United's low Air Freight rates

	per 100 pounds*
CHICAGO to CLEVELAND	$4.78
NEW YORK to DETROIT	$5.90
DENVER to OMAHA	$6.42
SEATTLE to LOS ANGELES	$9.80
PHILADELPHIA to PORTLAND	$24.15
SAN FRANCISCO to BOSTON	$27.00

*These are the rates for many commodities. They are often lower for larger shipments. Rates shown are for information only, are subject to change, and do not include the 3% federal tax on domestic shipments.



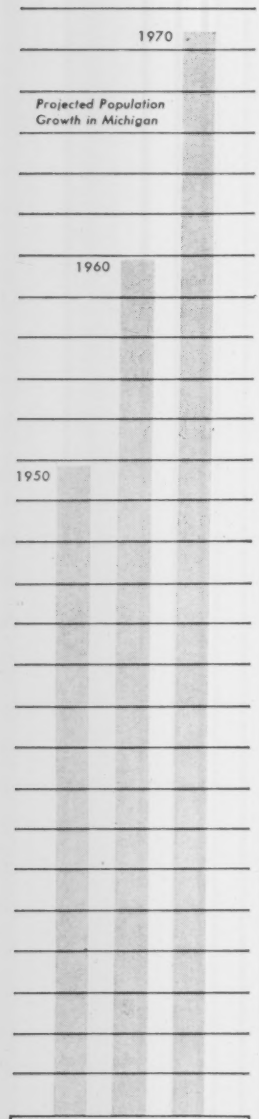
Door-to-door service

SHIP FAST...SHIP SURE...SHIP UNITED AIR LINES

For service, information, or free Air Freight booklet, call the nearest United Air Lines Representative or write Cargo Sales Division, United Air Lines, 36 South Wabash Avenue, Chicago 3, Illinois.

Why do Census Bureau projections indicate

MICHIGAN WILL GROW FASTER THAN 38 STATES?



Population projections just issued by the Bureau of the Census suggest that Michigan's population in 1970 may be 65% greater than it was in 1950. For the whole United States the projected maximum growth in the same period is only 38.3%.

The projected growth rate for Michigan is greater than that for any state except nine Rocky Mountain or coastal states. In number of persons to be added between 1950 and 1970 only *three* states outrank Michigan.

Why can Michigan be expected to grow faster than 38 states and to add more people than any of 44 states?

Because Michigan is growing faster *right now*, and has been for years.

Michigan's population grows because industry thrives in Michigan. Industry finds here everything that it needs, including—

- ★ **THE GREATEST FRESH WATER SUPPLY IN THE WORLD**
- ★ **WATER FOR INDUSTRIAL PROCESSING, FOR ECONOMICAL TRANSPORTATION, FOR RECREATION**
- ★ **CLIMATE AND LIVING CONDITIONS THAT ARE UNSURPASSED ANYWHERE**

Let our Industrial Development Department help you find the right location for *your* plant in Outstate Michigan.

Black area on map shows territory served by Consumers Power Company

CONSUMERS POWER COMPANY

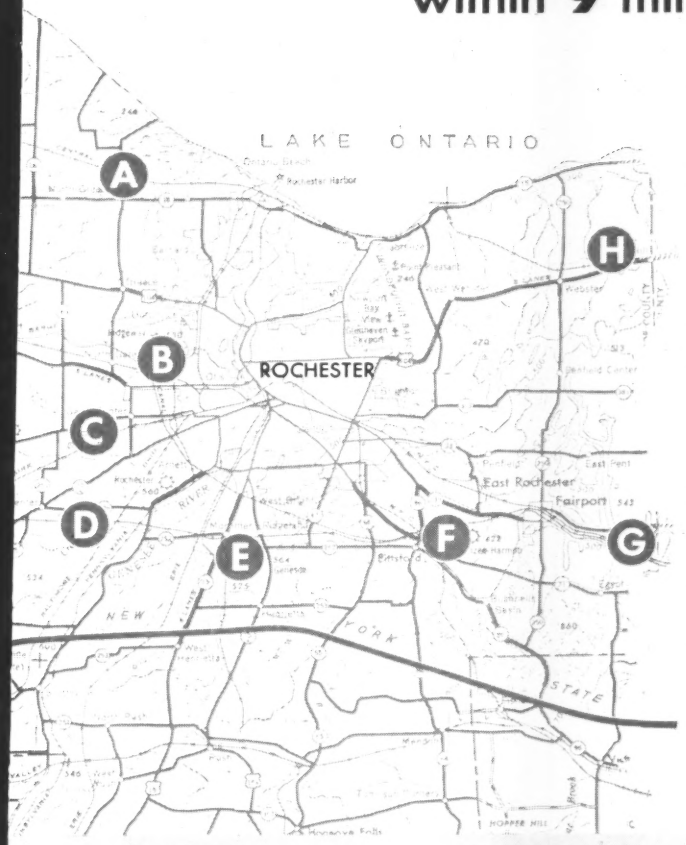
SUPPLYING ELECTRIC AND NATURAL GAS SERVICE IN OUTSTATE MICHIGAN

GENERAL OFFICES . . . Jackson, Michigan

DIVISION OFFICES . . . Alma • Battle Creek • Bay City • Flint • Grand Rapids
Jackson • Kalamazoo • Lansing • Muskegon • Pontiac • Saginaw • Traverse City

A CHOICE OF PLANT SITES

within 9 miles of Rochester, N. Y.



HERE are eight typical plant location areas in and adjacent to Rochester, N. Y. The sites vary in size from 325 to 1,150 acres. All or part of the individual properties can be developed to suit your needs and specifications.

The eight industrial sites are described and illustrated in our new brochure "Greater Rochester, New York Area, Industrial Sites."

These Central industrial properties in the Greater Rochester area are served with direct rail transportation by the New York Central Railroad. Roads adjacent to the sites provide access to the New York State Thruway.

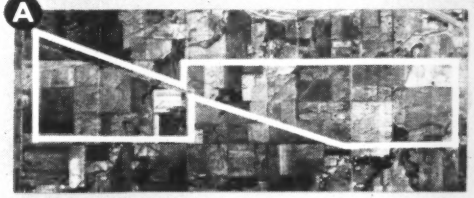
Rochester's geographic position makes the city an excellent location to establish a business devoted to manufacturing or distribution. The development of the St. Lawrence Seaway and the probable expansion of the Port facilities of Rochester mark the area as a region with a growing industrial future.

We have other Central plant sites in the Rochester area. Also many good industrial sites on the modern 11,000-mile rail network of the New York Central. Let us help you find a location that meets your requirements.

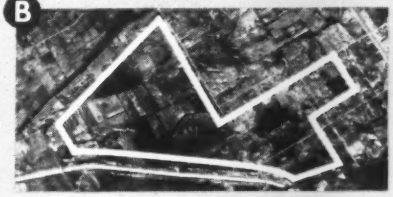
Route of the "EARLY BIRDS"—the one-day faster freight service

New York Central Railroad

GREECE, N. Y.
650 Acres

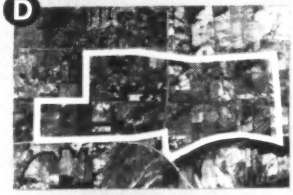


ROCHESTER, N. Y.
725 Acres

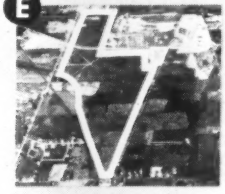


GATES, N. Y.
500 Acres

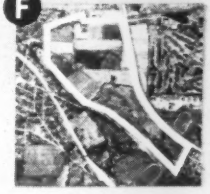
CHILI, N. Y.
760 Acres



HENRIETTA, N. Y.
450 Acres

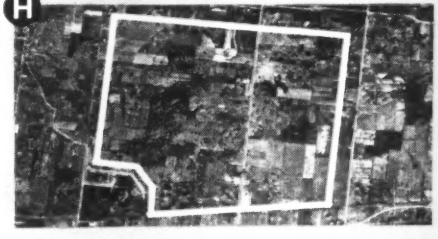


PITTSFORD, N. Y.
325 Acres



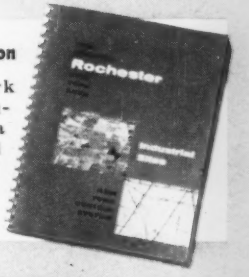
FAIRPORT, N. Y.
450 Acres

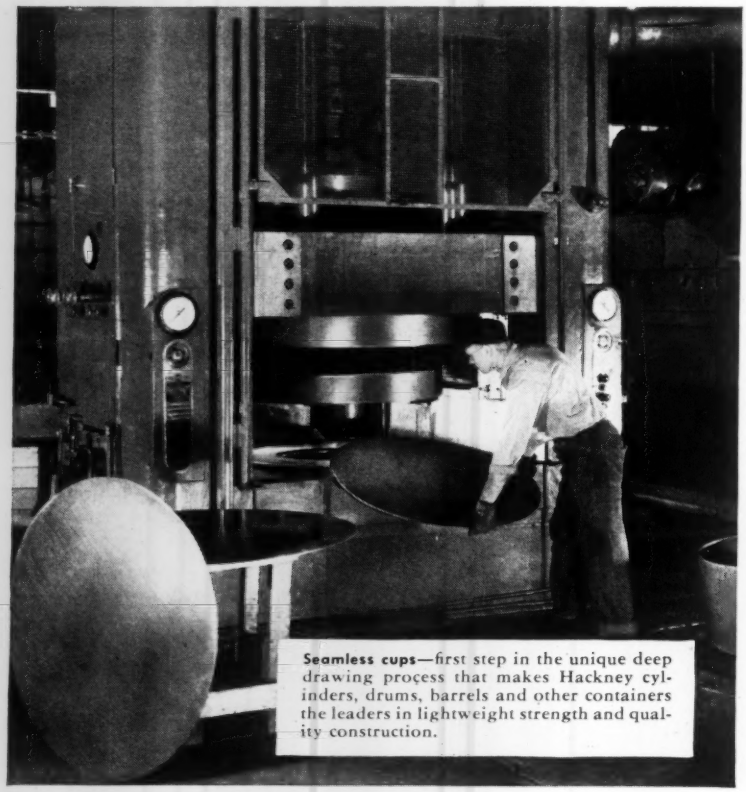
WEBSTER, N. Y.
1,150 Acres



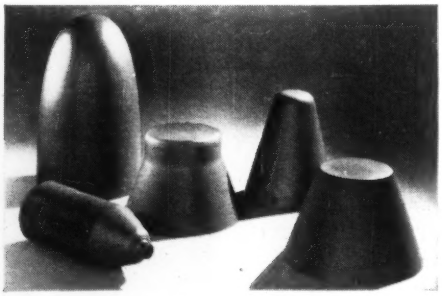
Send for illustrated brochure today — no obligation

A copy of "Greater Rochester, New York Area, Industrial Sites" will be sent to executives, free of charge, when requested on a business letterhead. Write to: Industrial Development Dept. E, New York Central Railroad, 466 Lexington Avenue, New York 17, N. Y.





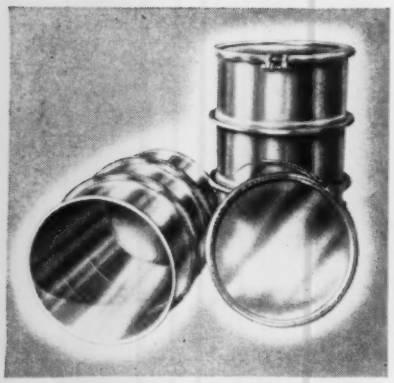
Seamless cups—first step in the unique deep drawing process that makes Hackney cylinders, drums, barrels and other containers the leaders in lightweight strength and quality construction.



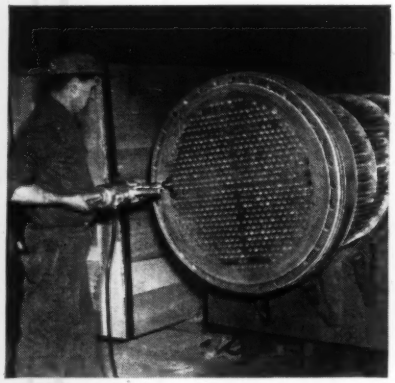
▲ **Special shapes**—to produce lighter, stronger products for varied industries. Hackney deep drawn shapes lower unit costs, cut production assembly time on pneumatic, hydraulic and refrigeration equipment.

Lightweight cylinders—cut shipping costs of high- and low-pressure gases. Built to meet the most rigid standards, these extra strong cylinders feature uniform wall thickness, crevice-free surfaces. ▼

Progressive shapes that shape industry's progress



Quality drums and barrels—to cut handling and shipping costs. Whether they are drums for food or acid, barrels for soap or paint, Hackney builds to the most exacting standards found in the container industry.



Heat exchangers—backed by extensive design experience in solving difficult heating and cooling problems at refinery, chemical and other processing plants. Built to order at Downingtown Iron Works, Inc., Division.

LP-gas fuel tanks—this cost-cutting fuel powers more and more trucks, tractors, lift trucks, buses, taxis... reduces maintenance costs. Easy-to-handle Hackney LP-gas tanks boost efficiency even more.

Pressed Steel Tank Company, 1465 S. 66th Street, Milwaukee 14, Wisconsin

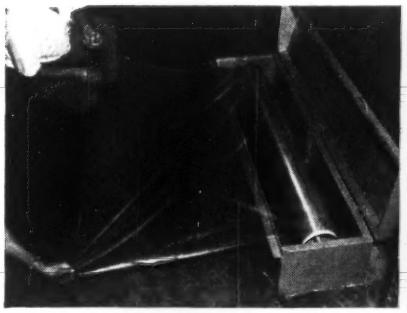
Pressed Steel Downingtown

Hackney MILWAUKEE — DOWNINGTOWN IRON WORKS

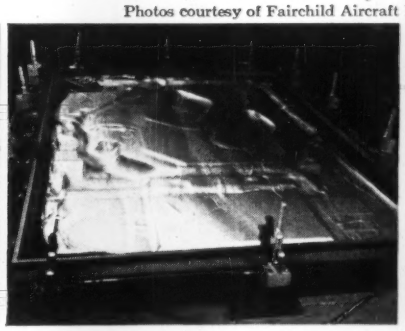
Manufacturer of Hackney Containers for Gases, Liquids and Solids

Heat Transfer Equipment
Steel and Alloy Plate Fabrication

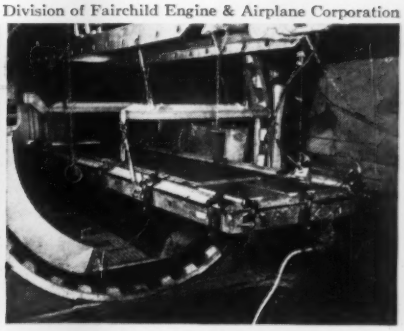
Photos courtesy of Fairchild Aircraft Division of Fairchild Engine & Airplane Corporation



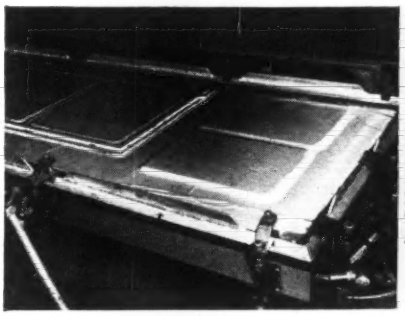
1. Reynolon "super-pli" PVA in humidified container.



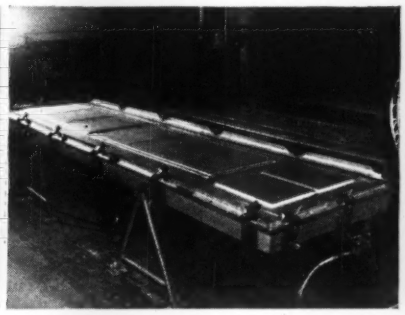
2. Metal bonding lay-up with 26" hg vacuum. Note fine deformation around tooling.



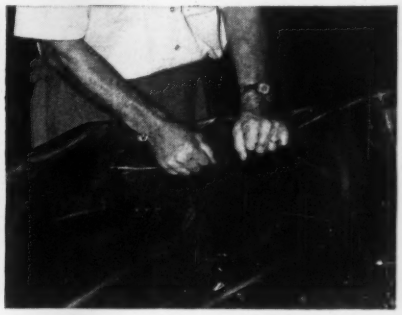
3. Lay-up emerging from autoclave after reaching 350°F temperature.



4. Closeup of same lay-up. Note continued sharp deformation of every detail.



5. Same lay-up after temperature has dropped to 290°F. Vacuum is still 26" hg.



6. PVA film used in photos 3, 4, 5. Note Reynolon "super-pli" PVA is still pliable.

NEW REYNOLON "super-pli" PVA

TRADE MARK

REDUCES COSTS
TAKES TO COMPLEX SHAPES
WITHSTANDS HIGH HEAT AND PRESSURE
IN METAL BONDING APPLICATIONS

Here is a new "super-pli" Polyvinyl Alcohol film — another Reynolon first in plastic films — developed to improve adhesive metal bonding.

Now an inexpensive PVA sheet, instead of a costly rubber blanket, can be used to hold a lay-up in perfect alignment during the adhesive curing cycle in an autoclave. The new MBA Series of Reynolon "super-pli" PVA withstands temperatures up to 500°F and pressures required to insure a satisfactory bond. It is extremely pliable and can be formed into difficult contours without bridging.

This new Reynolon film has already proved its worth in the construction of aircraft wing and fuselage sections, doors and trailing edge assemblies. It also offers real value to the automotive, boat, appliance, and many other industries. For full details and for technical assistance on the many polyvinyl chloride and polyvinyl alcohol film applications call the Reynolds Office in New York, Camden, Detroit, Chicago, St. Louis or Los Angeles. Or write to Plastics Division, Reynolds Metals Company, 40 Boulevard Ave., Grottoes, Virginia.

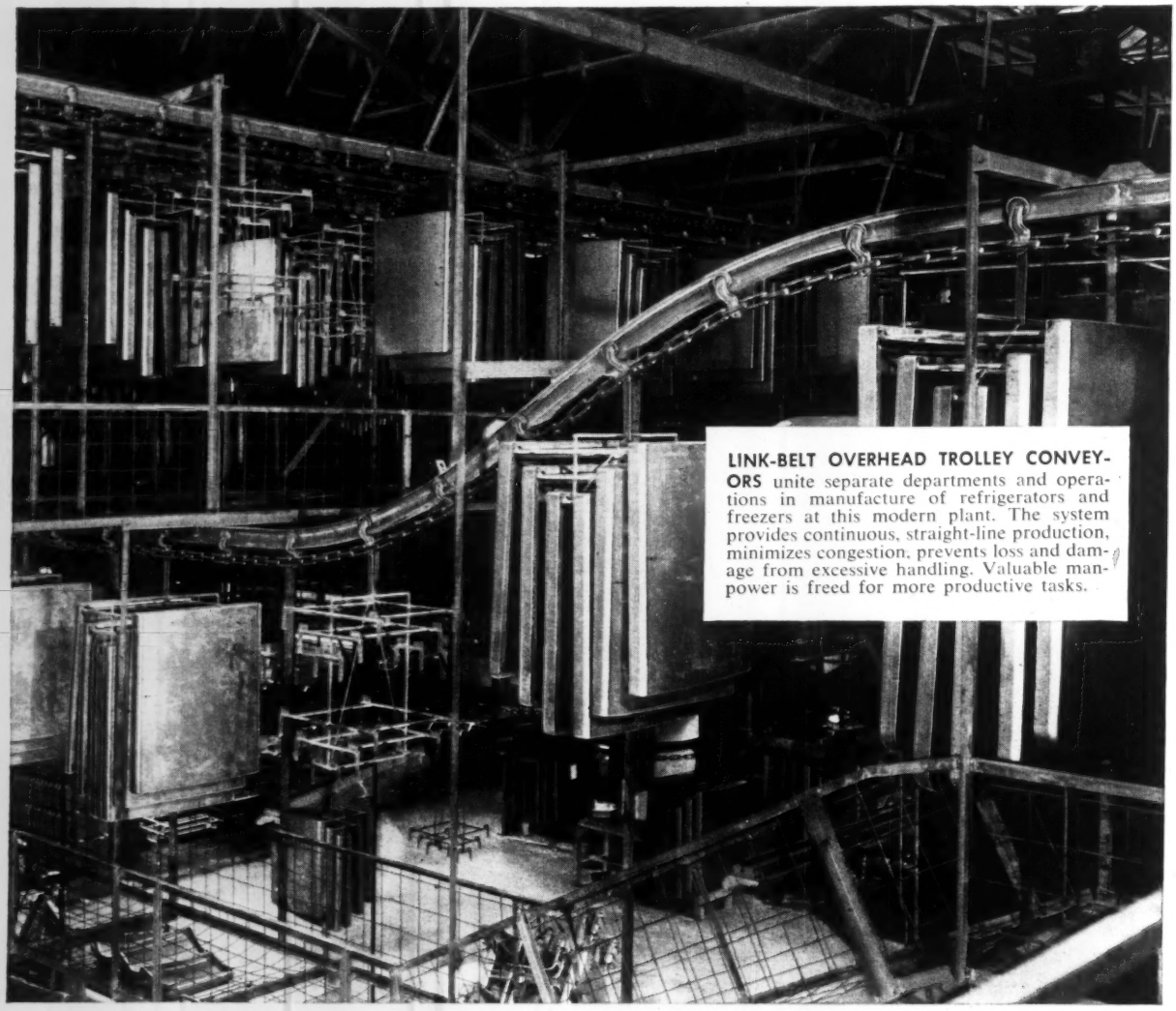
polyvinyl alcohol films for—
BAG MOLDING
METAL BONDING
SOLUBLE PACKAGING

polyvinyl chloride films for—
SKIN PACKAGING
INFLATABLES
OXYGEN TENTS
GLASS SUBSTITUTIONS
PROTECTIVE COVER PRODUCTS

REYNOLON
PLASTIC FILM
Plastics Division
Reynolds Metals Company

PLASTICS DIVISION
REYNOLDS METALS COMPANY

How to make "overhead" an asset



LINK-BELT OVERHEAD TROLLEY CONVEYORS unite separate departments and operations in manufacture of refrigerators and freezers at this modern plant. The system provides continuous, straight-line production, minimizes congestion, prevents loss and damage from excessive handling. Valuable manpower is freed for more productive tasks.

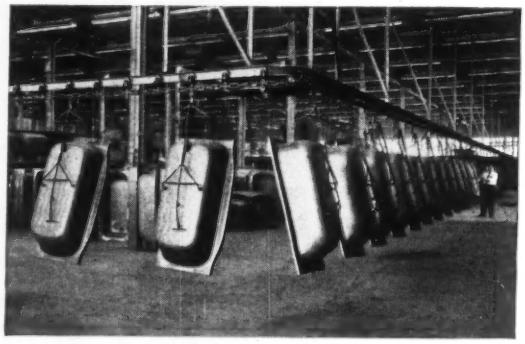
Put your ceilings to work with Link-Belt overhead trolley conveyors

IF you want to clear your aisles and put *inventory on wheels*, learn how Link-Belt overhead trolley conveyors convert "overhead" to traffic and storage uses. Whatever your layout obstacles, our conveyor specialists will set up steady, *straightline-production*, release valuable floor area and utilize now wasted ceiling space. For facts, call your nearest Link-Belt office. Or write for Book 2479.

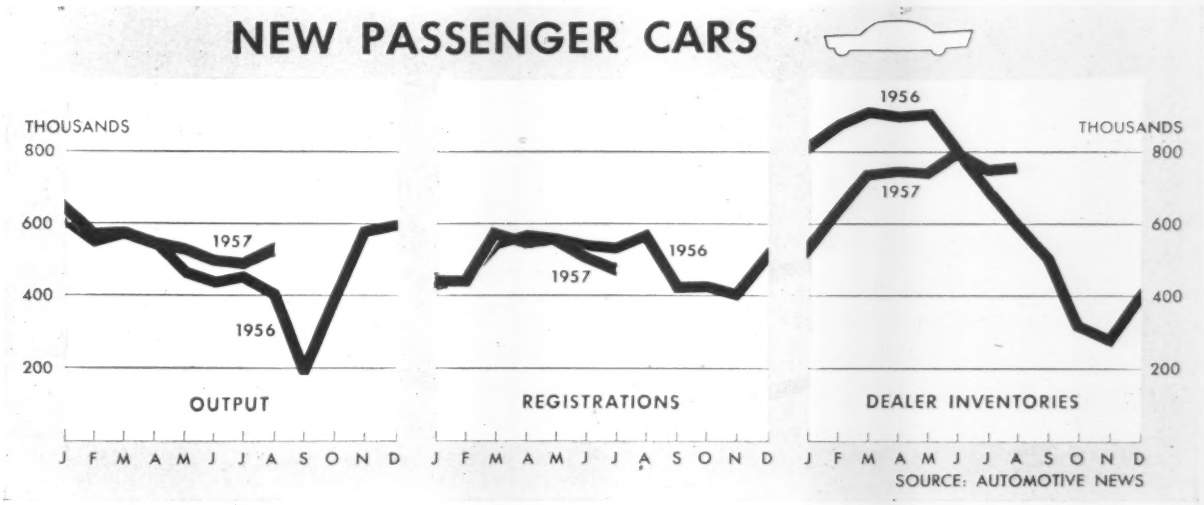
LINK-BELT

OVERHEAD TROLLEY CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.710



MATERIAL RIDES TO THE WORK SPOT under push-button control. Link-Belt overhead trolley conveyors move inventory through various stages of live storage, production, testing and transport. Resulting efficiencies create faster production flow, lower costs and improved product quality.



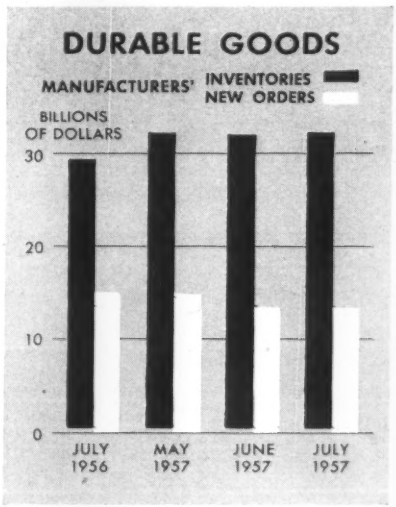
THE TREND OF BUSINESS

CONSUMER BUYING and the level of total business activity continued high through the early Fall weeks with gains in many sectors. Genuinely gloomy prophecies were rare, but many a dark reference to a "sideways movement," "plateau," and "leveling off" was heard—and the gains, in consequence, were somewhat obscured. Back of the worries were such tangibles as cuts in defense spending, declines in factory employment, higher prices and interest rates, and perhaps a feeling that inflation couldn't keep on forever.

Some of the gloom clouding the durable goods picture was dispelled as the long-hoped-for rise in consumer outlays for major appliances showed signs of becoming a reality. In late August and early September, sales of automatic dishwashers and laundry equipment improved appreciably, offsetting in part the seasonal drop in air conditioners and refrigerators. While total volume in major appliances still was less than in 1956, a revival in home building is expected to lift sales in the last quarter closer to year-ago levels.

Although not so optimistic as a year ago, specialists in the furniture and bedding industry expect good business for the remainder of the year. Manufacturers of both furniture and major appliances were encouraged by increased buying at the wholesale and manufacturing levels. More good news was found in reports that September inventories of household goods at all levels were close to those of last year.

Much of the strength in retail trade was found in sales of children's back-to-school clothing. Newspaper strikes in late August hampered some sales promotion activities, but volume in Fall apparel ran moderately above comparable 1956 levels. Retailers of food sold more than they did last year, although, as in other lines, part of the increase reflected higher prices. Spot estimates from DUN & BRADSTREET offices showed that the year's small gain in total retail dollar volume was maintained in September.



U.S. Department of Commerce figures show a slight rise in the seasonally adjusted book value of July manufacturers' stocks.

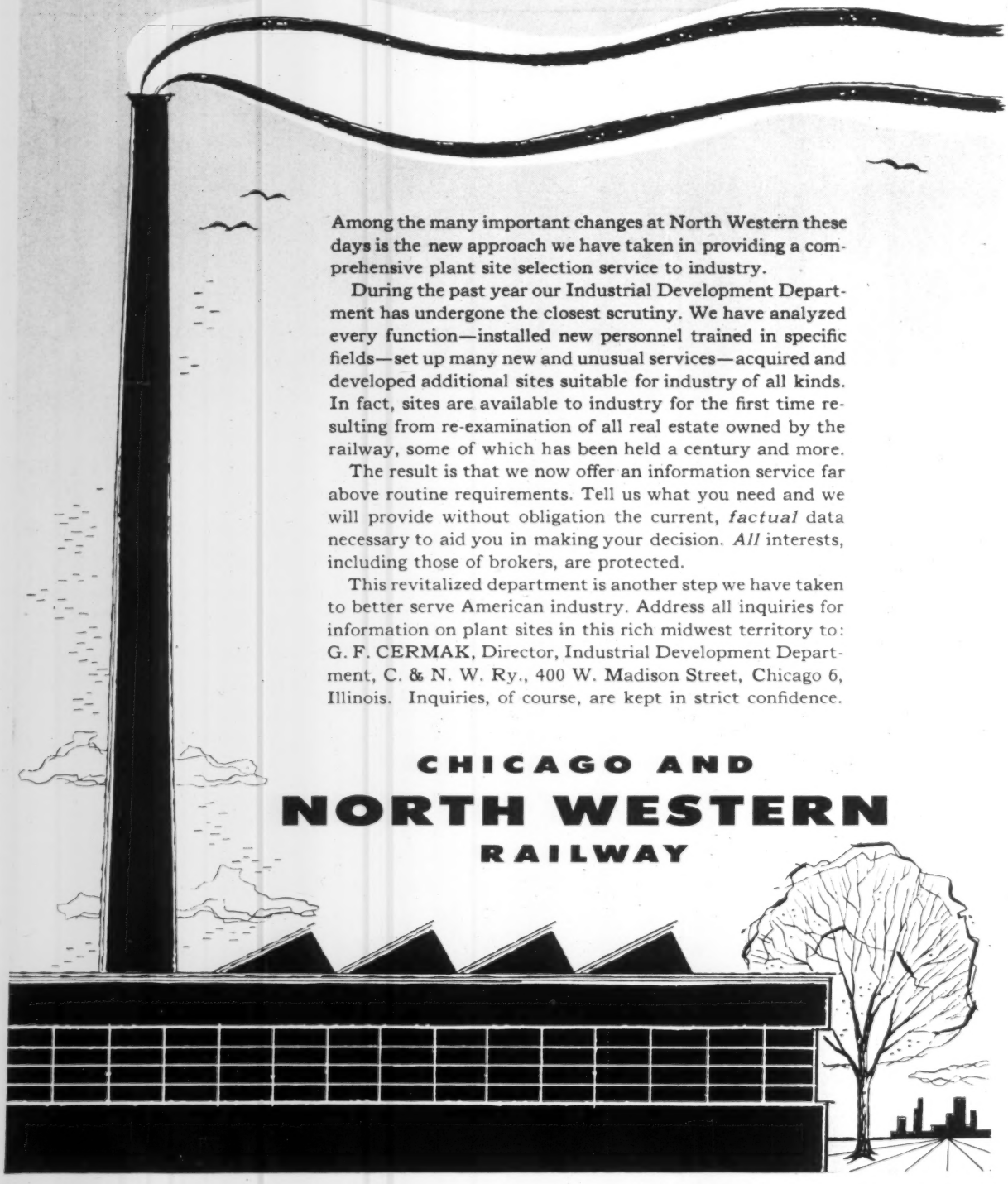
Auto sales improve

Sales of passenger cars rose significantly in August and early September, according to preliminary reports. Medium-priced models accounted for a greater proportion of the market than in the comparable period of 1956. Dealers' stocks were well above the year-ago level on September 1, with part of the addition representing insurance against the recurrence of shortages appearing last Autumn. Dealers foresee a satisfactory clean-up of 1957 models. This would push 1957 sales a bit above 6 million units.

Looking further ahead, some auto producers expect a moderate rise in volume next year. More extensive model changes and a runoff of install-

A New Concept

of Industrial Site Service



Among the many important changes at North Western these days is the new approach we have taken in providing a comprehensive plant site selection service to industry.

During the past year our Industrial Development Department has undergone the closest scrutiny. We have analyzed every function—installed new personnel trained in specific fields—set up many new and unusual services—acquired and developed additional sites suitable for industry of all kinds. In fact, sites are available to industry for the first time resulting from re-examination of all real estate owned by the railway, some of which has been held a century and more.

The result is that we now offer an information service far above routine requirements. Tell us what you need and we will provide without obligation the current, *factual* data necessary to aid you in making your decision. *All* interests, including those of brokers, are protected.

This revitalized department is another step we have taken to better serve American industry. Address all inquiries for information on plant sites in this rich midwest territory to: G. F. CERMAK, Director, Industrial Development Department, C. & N. W. Ry., 400 W. Madison Street, Chicago 6, Illinois. Inquiries, of course, are kept in strict confidence.

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LOOKING FOUR QUARTERS AHEAD . . .

First Quarter 1957	Second Quarter 1957	Third Quarter 1957	*Figures in billions of dollars at seasonally adjusted annual rates*	Fourth Quarter 1957	First Quarter 1958	Second Quarter 1958	Third Quarter 1958
429.1	434.3	437.3	GROSS NATIONAL PRODUCT	441.5	444.6	446.4	448.4
276.1	278.9	281.9	CONSUMER SPENDING	285.8	288.6	291.4	294.1
85.6	86.9	87.4	GOVERNMENT OUTLAYS	87.3	87.4	87.7	87.8
66.8	68.5	68.0	PRIVATE INVESTMENT	68.4	68.6	67.3	66.5

BUSINESS will climb sluggishly at best after the first quarter of 1958, even with the help of sluggish inflation. Prospects are that next Summer total outlays for goods and services (gross national product) will still exceed last Summer's level by $11 billions (seasonally adjusted annual rate)—in contrast to the rise of over $20 billions occurring in the comparable 1956–1957 period. The loss of momentum arises in good part from efforts to cut back or to stretch out defense spending.

Physical expansion will be smaller still. In constant prices, gross national product will barely creep upward after mid-Winter. On a seasonally adjusted basis, the Federal Reserve Board index of industrial production should reach 147–148 late this year or early next year, but dip moderately thereafter. With this pattern and with both number of job seekers and productivity per man increasing, the seasonally adjusted volume of unemployment should be running between 4.5 per cent and 5 per cent of the civilian labor force by mid-1958, as against 4.2 per cent last August.

The foregoing appraisal assumes that the Federal Government will not slacken its efforts to reduce outlays for defense; that a Federal pay rise will not take effect during the period; that credit will remain fairly tight; and that while tax cuts, affecting mainly personal income tax yields, will occur in 1958, no significant resulting stimulus will be felt before mid-year.

On these bases, *government spending* will do little better than hold its own. Outlays by states and municipalities should rise around $3 billions (annual rate) over the next four quarters, but the gain will be largely offset by a drop in Federal purchases.

Private investment, after advancing moderately in the Fall and Winter, should level off in the Spring and then dip somewhat in the Summer. Looking at major components:

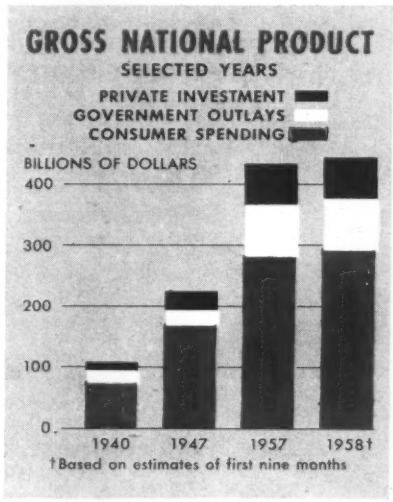
1. *Net foreign investment*—the margin of exports other than foreign aid over imports—should decline continuously.

2. For reasons developed in the August issue, an uptrend in *nonfarm housing* is in prospect.

3. The pattern for *other fixed domestic investment* will be less consistent. Even with improvement in sales of farm machinery and the high expectation of many machinery producers for new orders, total spending for plant and equipment should barely hold its own through the next quarter and trend moderately downward in 1958.

4. Despite producers' decreased need for *inventories* to support output for defense uses, a further small addition to stocks ought to occur this Fall and Winter as auto makers load dealers to insure that supplies will be on hand if there is a strike next June and other retailers seek to restore normal sales-stock ratios. But accumulation will taper off in the Spring and will cease, if supplies do not start to decline, next Summer.

5. *Consumer outlays* should advance uninterruptedly. While pretax personal income is unlikely to rise as fast in the year ahead as in the past two quarters, the effect of any slowdown on spending will probably be cushioned by a low consumer savings ratio through next Spring and by a tax cut next Summer.



EDWIN B. GEORGE, *Director of Economics*
ROBERT J. LANDRY, *Economist*
Back figures from National Income Division, U.S. Department of Commerce. Future estimates by the authors.

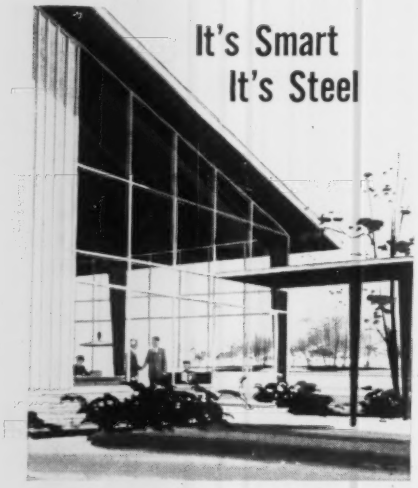
ment debt contracted in 1955 bringing many buyers back into the market, are counted on to outweigh higher price tags, and larger sales of foreign cars.

Prices edge up

Economists and business men were discouraged by the continued rise in prices. In August, living costs increased to the highest point on record for the twelfth month in a row, partly nullifying a moderate rise in factory workers' take-home pay. The rise in the over-all cost of living does not appear to have been reversed in early September.

At 121.0 (1947-1949=100), the consumers' price index in August was more than 3.5 per cent higher than the year-ago level, and was fractionally above the 120.8 of the previous month. While all the major components of the index advanced, the largest gain stemmed from a contraseasonal jump in food prices. Food costs are expected to fall somewhat in September and October. Housing costs in August rose only 0.2 per cent, and most of the other components barely edged up. Over 150,000 workers in certain industries were scheduled to receive wage boosts as a result of the price increase.

continued on page 42



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Following six months of stability, wholesale prices also inched upward in August, and many economists expect the gradual rise to continue. This somewhat dimmed the hopes of Government officials that inflation might be coming to an end. The over-all wholesale price index (U.S. Bureau of Labor Statistics) was 18 per cent above the 1947–1949 average.

Income higher

One of the brightest spots in the business picture was the rise in personal income. It reached an annual rate of $347.3 billion in August, a year-to-year gain of 4 per cent. Wage and salary disbursements continued to edge up, surpassing last year's level by a comfortable margin. While payrolls in trade and services and proprietors' and rental income rose noticeably, many business men were discouraged by the news that manufacturing payrolls fell slightly in August.

By using nearly $3.8 billion installment credit in July, consumers boosted their installment debt 8 per cent over that of July 1956. However, payments were higher than in June and last July.

Consumers saved 7 per cent of their spendable incomes in the third quarter of 1957, a little more than they did in the first half. While this exceeded the 6 per cent level that prevailed in most of 1955, it was less than the 8 per cent of 1951–1953.

continued on page 44

BUSINESS SIGNPOSTS

1939 Average	1947 Average	Selected WEEKLY Indicators†	Latest Week	Previous Week	Year Ago
102	163	**STEEL INGOT PRODUCTION** Ten Thousand Tons (a)	211	210	250
25	49	**ELECTRIC POWER OUTPUT** Ten Million KW Hours (b)	120	120	115
76	121	**BITUMINOUS COAL MINED** Hundred Thousand Tons (c)	101	101	102
69	92	**AUTOMOBILE PRODUCTION** Thousand Cars and Trucks (d)	66	103	50
35	98	**DEPARTMENT STORE SALES** Index 1947–1949 = 100 (e)	130	113	130
5	13	**BANK CLEARINGS** Hundred Million Dollars (f)	118	124	114
284	67	**BUSINESS FAILURES** Number of Failures (f)	287	237	262

1939 Average	1947 Average	Selected MONTHLY Indicators‡	Latest Month	Previous Month	Year Ago
58	100	**INDUSTRIAL PRODUCTION** Index 1947–1949 = 100 (e)	144	144	143
58	95	**NONFARM COMMODITY PRICES** Index 1947–1949 = 100 (g)	125.9	125.7	122.5
37	100	**FARM COMMODITY PRICES** Index 1947–1949 = 100 (g)	93.0	92.8	89.1
59.4	95.5	**CONSUMERS' PRICE INDEX** Index 1947–1949 = 100 (g)	121.0	120.8	116.8
3.5	10.0	**RETAIL SALES** Billions of Dollars (h)	17.7	16.9	16.2
5.4	15.6	**MANUFACTURERS' SALES** Billions of Dollars (h)	26.7	28.3	24.3
45.8	58.0	**EMPLOYMENT** Millions of Persons (h)	66.4	67.2	66.8
72.9	190.5	**PERSONAL INCOME** Billions of Dollars, seasonally adjusted annual rate (h)	347.3	346.2	329.3
103	257	**BUILDING PERMIT VALUES** Millions of Dollars (f)	563.0	555.4	615.3

SOURCES: (a) Amer. Iron & Steel Inst.; (b) Edison Elect. Inst.; (c) U.S. Bureau of Mines; (d) *Automotive News*; (e) Federal Reserve Board; (f) DUN & BRADSTREET, INC.; (g) U.S. Bureau of Labor Statistics; (h) U.S. Department of Commerce. †WEEKLY INDICATORS: Steel data for the fourth week of September; sales for the second week; all others for third week. ‡MONTHLY INDICATORS: Manufacturers' sales for July, all others for August.

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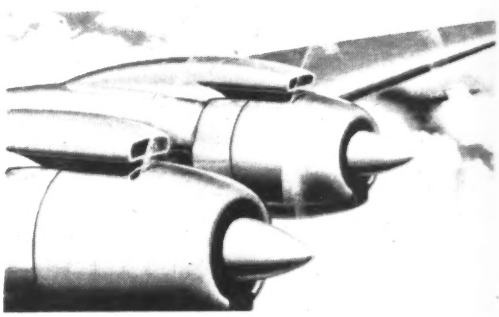
the blue-ribbon engine that "packages" global travel



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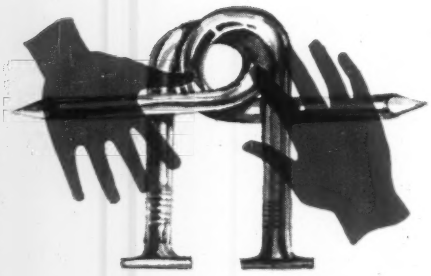
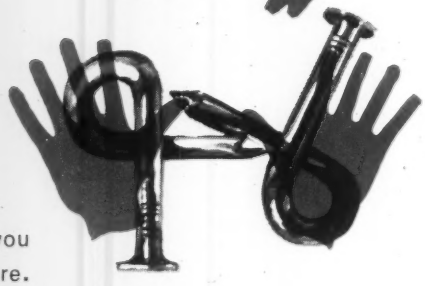
TURN



TWIST

SLIP

SOLVE



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Factory employment slips

Another peak in employment was set in July, as a record number of Summer workers were hired. Numbering 67.2 million, civilian job totals were about 1 per cent higher than in July last year. Although the anticipated decline in trade did not occur, the rise in construction employment was a bit curtailed by the effects of a cement shortage. At about 3 million, the jobless in July outnumbered those of last year by about 3 per cent. They comprised a little over 4 per cent of the total civilian labor force.

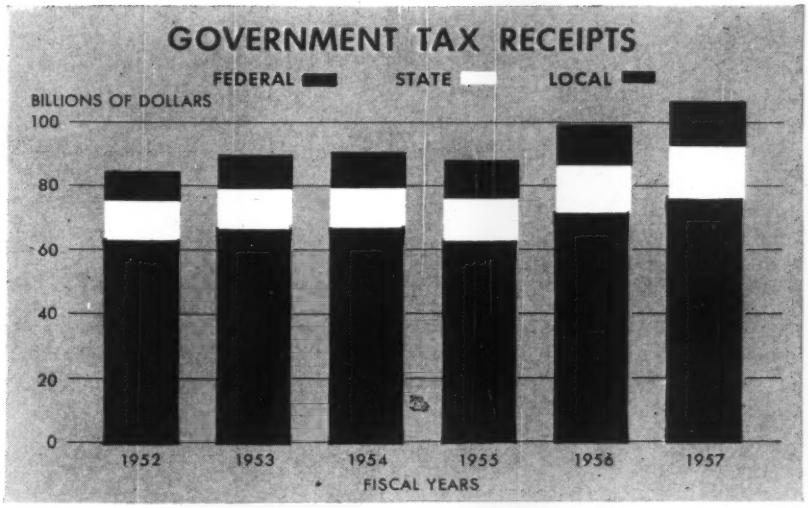
Employment fell about 800,000 in August, largely because of a sharp decline in farm jobs and a less than seasonal rise in factory work. However, the decline was outweighed by a sizable reduction in the labor force. This lowered unemployment by about 400,000, holding the ratio of unemployed to jobseekers at the July level. There were numerous recalls of temporarily laid-off workers in the appliance industry, as manufacturers' orders improved and prospects brightened. If employment in the appliance field continues to climb, the labor surplus situation in three important areas—Detroit, Mich., Erie, Pa., and Knoxville, Tenn.—may be somewhat alleviated.

Equipment orders rise

Pressured by the expectation of further price increases, manufacturers sharply boosted their orders for machine tools. Incoming business in July soared 30 per cent ahead of June, but continued a little below a year ago. Higher costs for labor, transportation, and materials were responsible for price rises of about 6 per cent. Despite the July advance, total orders for the first seven months of the year lagged considerably behind the comparable 1956 level.

Capital spending eases

Outlays for plant and equipment, as a whole, while still rising, are in process of leveling off, and may begin to decline some time this Autumn, disappointing the earlier expectations of a slight rise into 1958. The change in spending plans stems largely from a softening of sales last Winter and Spring, reinforced by recent and prospective cuts in defense



Total tax receipts exceeded $100 billion for the first time in fiscal 1957, and were over twice as high as in 1944, the peak wartime year. This level was 80 times higher than in fiscal 1902. The 1957 state and local totals are estimates made by the Tax Foundation.

spending. Manufacturers will be reluctant to spend money for the expansion and improvement of facilities until their taxes are reduced and production costs stop rising.

Production high

Industrial output perked up a little in August and was close to the level of a year ago. Although falling short of expectations, steel output in August bounced ahead of both July and August 1956. Only in 1953 and 1955 was August steel output higher. During the first eight months of this year, steelmakers set an all-time record for the period. If the present rate of production is maintained for the rest of the year, output for 1957 will equal or slightly exceed that of record 1955.

Although shutdowns for the model-changeover period began to appear in September, automotive output remained noticeably higher than a year ago. The total production of passenger cars for the first eight months of 1957 was almost 9 per cent higher than in the similar period last year. Total 1957 will be second only to 1955. There were gains from both July and a year ago in electric power output in August and early September.

Contrasting with the heightened activity in the steel, automotive, and electric power industries, output among petroleum and coal producers faltered somewhat, falling appreciably below a year ago. Despite a moderate decline in imports, crude oil stocks at the beginning of September reached the highest level on record. While production in durable goods factories picked up in September, it remained slightly below a year ago.

Home building up

On a seasonally adjusted basis, privately financed housing starts rose in August, reaching an annual rate of over 1 million for the first time this year. At present, it appears clear that starts for 1957 as a whole will run well above 900,000 units.

Builders did not share the view of FHA officials that liberalized home loan terms would result in a considerable upturn in home building. The FHA expects that lower down-payments and higher interest rates will stimulate new housing starts in four or five months. However, members of the National Association of Home Builders believe that while lenders remain highly selective in picking risks, building would improve only slightly.

Business men were pleased with the slight rise occurring in heavy construction contracts in July and August. The cumulative total for the first eight months of 1957 fell about 15 per cent below the record 1956 level, according to the *Engineering*

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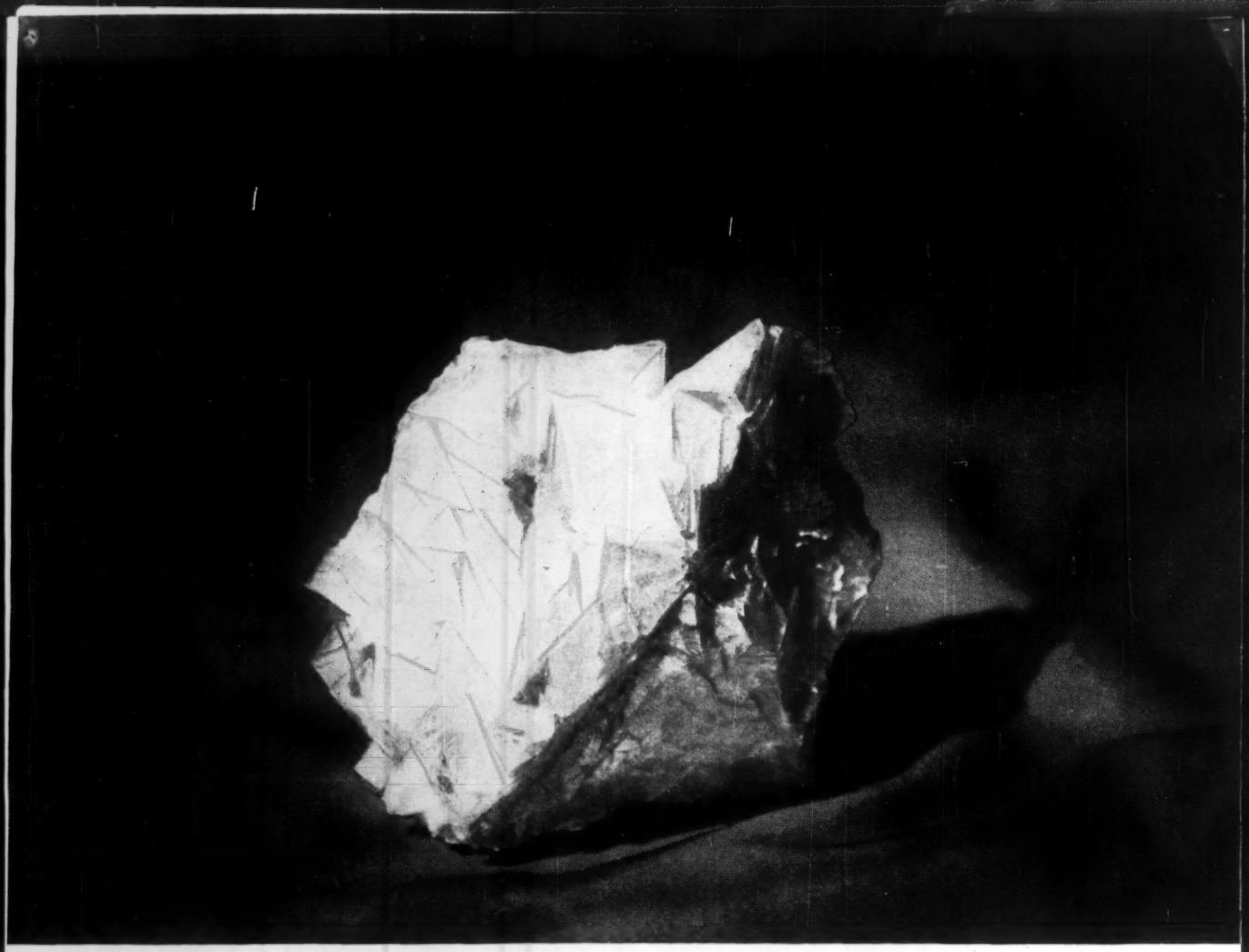

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Trade-mark of Synthetic Mica Corporation for synthetic mica. **Chem:** Synthetic mica is a fusion of silica, alumina, magnesia and alkali fluorides — it can be made chemically pure with a wide range of properties for special applications. **Physical:** *(example: Synthamica 202)* melting point 1365°C; Specific heat 0.2; specific gravity 2.9; Hardness (MOH's) 3.4; transparency — excellent; Gassing in vacuum at high temperatures — far superior to natural muscovite mica; maximum continuous operating temp. — 1000°C. **Mechanical:** SYNTHAMICA is available in crystals, powder, sheets and paper-like mats. **Potentialities:** Taking advantage of the controlability of synthetic mica properties, high purity and refractoriness Mycalex Corporation of America has developed SUPRAMICA* ceramoplastics, made with SYNTHAMICA synthetic mica to produce superior electrical insulators with dimensional stability, ability to retain metal inserts molded in place, and outstanding dielectric and thermal properties.

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News Record. This reflected in part the lag in plant construction. Highway construction got well under way in August, and was sharply above the year-ago level. Construction costs soared, mainly because of higher prices on structural steel and wage increases.

Farm income rises

Farmers were a little better off in the first half of this year than in the similar 1956 period. At an annual rate of $12.1 billion, net farm income was 2.5 per cent higher than in the first six months of 1956. Cash receipts from farm marketings rose because of higher average prices. This price trend continued in August, but was hampered in early September by estimates of larger crops.

Prices received by farmers in August showed a year-to-year gain of nearly 3 per cent. The increase was stimulated by rising livestock prices. Prices paid by farmers rose even more than prices received.

Officials of the Department of Agriculture expect that in 1957 farm production will drop about 4 per cent below last year's volume, but that the year will be the third largest on record.

Over-all

The long period of prosperity has left so many businesses and consumers with inventories of new durables and reserve supplies of nondurables that further purchases depend more upon state of mind than upon real need. This is always true to some extent. The state of mind may be affected by thoughts of tomorrow's probable prices, fashions, desire to save, and so on.

From any background—whether of the sections of the economy reviewed here or of the GNP and Business Men's Expectation's quarterly presentations—one conclusion only can be drawn now: All factors continue to point to continued prosperity, with less rapid growth of debt and of dollar aggregates than during recent "slow inflation" months.

This is a report prepared in the Business Economics Department, Dun & Bradstreet, Inc., by John W. Riday.

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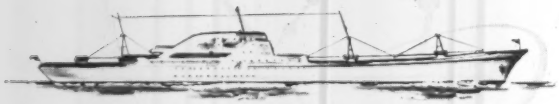
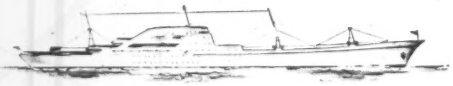
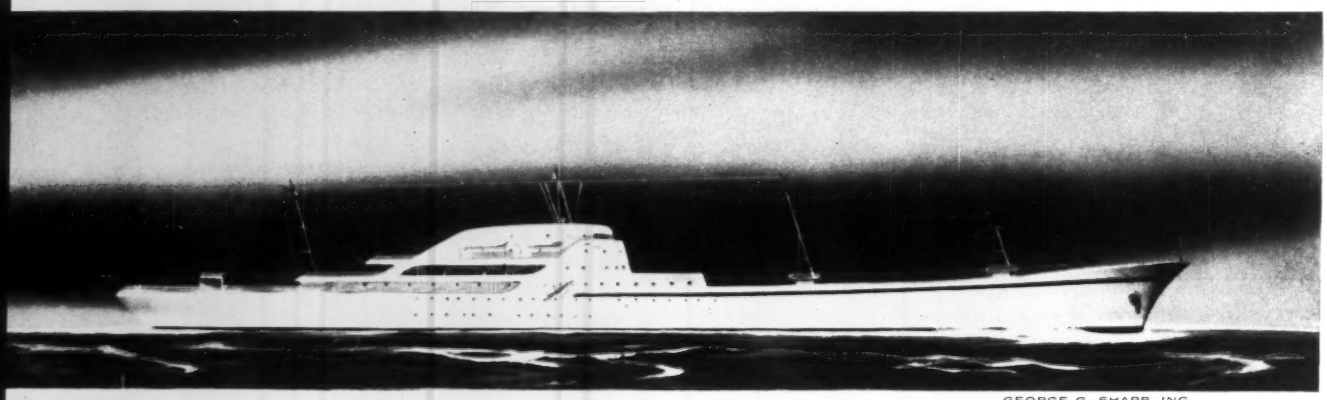




Leading the Way to a Nuclear-Powered Merchant Fleet



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THE BUSINESS MAN AND HIS LAWYER

ELMER M. CUNNINGHAM, *Roberts & McInnis*

Every company needs a lawyer, but all too frequently the business executive feels irked by the deliberate pace and cautious approach of the legal profession. The relationship will be a much happier one, says this practicing attorney, if the business man knows how to select a good lawyer, work with him most advantageously, and judge the reasonableness of his fees.

THE EXECUTIVE vice president strode through the anteroom and entered his office frowning. His secretary lifted her eyebrows; she recognized that a disturbance was brewing.

"Find out how much we paid Smith, Black, Brown & White so far this year—and for what services," the vice president said. His secretary shook her head as she closed the door behind her. Those lawyers were annoying him again.

Almost every business action has legal implications, explicit or implicit. This is as true for small- and medium-sized companies as it is for the corporate giants. The lawyer is a business necessity, though an evil one if you like.

The average business management sees its lawyers more often than the individual executive sees his doctor. In 1954, lawyers received half their gross income from the business community; and a third of lawyers in private practice obtained more than half their income from business.

But this relationship is not always an altogether happy one. There are a lot of jokes about lawyers, and when a business man tells them he isn't always joking. Executives complain that the legal profession is slow, negative in its attitude, and expensive. The lawyer, they say, expects a lot of money for spending a lot of time being not particularly helpful. This critical view of "counsel," unfortunately, has enough substance to merit a frank discussion. And an examination of it may help the business man select the lawyer who will be best for his particular company.

Caution vs. Action

Perhaps it is natural for the business client to have little patience with the time consumed in answering his legal questions. He and his lawyer have been trained to somewhat conflicting mental attitudes.

The business executive lives in a world of motion. New product! Call the advertising agency, get a layout, buy advertising space. Customer's loyalty getting wobbly! Shuffle the sales organization, have those supervisors make more personal calls, send a vice president on the road. Expand! Why, his company will build a plant twice as fast as his competitor can. Business thinks and plans, of course,

but action is generally the keynote.

The lawyer lives in a different world. Meticulous care is ingrained in him; caution is his ever-present guide. Examine everything before you jump. Look up, look down, look all around. Then recheck it all again. Haste may make waste, but it always means bad advice. Thought is the hallmark of good lawyers.

These two conflicting but not irreconcilable attitudes set the stage for irritation.

Sometimes the business man is at fault. Often he sets too short a timetable, or he doesn't consult the lawyer until just before the lightning is going to strike. Characteristically he turns the pressure on himself, and then tries to put pressure on his lawyer. He'll imply, sometimes say: "Now, don't give me a lot of whereases," or "All I want is a simple yes or no." If he has suppressed ambitions to be a lawyer he may add: "Of course, I know it can be done but we thought we'd check with you."

If a law firm seems too slow in providing service, it is not because the lawyers are indifferent to their clients' problems. Good lawyers are anything but lazy, and like anyone else they want to have "satisfied customers."

The fact is that a surprising number of business men do not recognize the magnitude or complexity of some of the legal matters on which they want a quick answer. Some questions, it is true, are simple, but in most cases the lawyer must consider each fact carefully before he can give good advice. Sometimes several experienced lawyers must practically live in the law library for weeks to find the answer.

Accuracy Rather Than Speed

Quick service, the business man should remember, is not the main objective. Good legal service means accurate service. Speed and careful analysis are necessarily somewhat in conflict. The good lawyer is reluctant to give an answer on the telephone, because he knows that the case is likely to be more complex than the client has made it appear, and that clients are likely to act on offhand opinions even when they are told the advice is tentative.

In some cases, however, the client may have a legitimate complaint about his lawyer's slowness. The law firm he deals with may have an inadequate staff because the dominant partners have been trying to keep too large a proportion of the fees for themselves. Or the lawyers may have little knowledge of business operation and the time elements of the various phases of that operation. Constant slow service in any field except litigation *may* indicate the law firm is poorly managed.

The Answer Is "No"

The business man may sometimes feel stymied, not because his lawyer is slow in arriving at answers but because the answer is usually: "No!" For it cannot be denied that there are some lawyers who are negative in their attitudes.

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One type of negativist seems to have an unconscious feeling of superiority over the client. He believes the client came to him not so much for help as to receive a judicial ruling. Since the answer is not clearly "yes," then it must be "no." This lawyer is more wrapped up in the stated prohibitions of the past than in the uncharted advances of the future.

Perhaps the larger negative group is composed of lawyers who do not want to take responsibility for tough decisions. If the answer is not clearly "no," then it may be "yes" or "no" in the future. But who are they to say? They lack the confidence to analyze a legal trend and give an opinion on how a court will decide a knotty problem.

The more resourceful members of the profession ascertain what the business client wants to accomplish. Often there will be a legitimate alternative for reaching the goal.

Creative legal talent is the mark of a great lawyer. The late Arthur T. Vanderbilt, Chief Justice of the Supreme Court of New Jersey, wrote:

". . . to the practicing lawyer, dealing with complicated situations, it must often appear to be all-out effrontery to attempt to forecast the law. Yet he cannot escape it, it lies at the heart of the work of our profession."

Answers there can be, but not every answer can be an unqualified "yes" or "no." Where the question is close, the good lawyer will always explain his reasoning, the extent of the risk involved, and the imponderables. He will then suggest the preferred course.

But there are still situations where the answer must be a flat negative, and the business man may resent it. Steps that appear fair and reasonable to him may be illegal.

Pricing practices among competitors will do for an example. Most business men know all the fundamentals. If one company raises or lowers prices, all other companies in the industry will usually follow suit. There is nothing illegal about voluntary and independent equal pricing to meet competition.

On the other hand, an agreement to fix prices is illegal. So are price setting designed to eliminate competition, special reductions from list prices required not to meet competition but to gain customers, and certain pricing schemes involving more than one product.

The dividing line between permissible "meeting" competition and forbidden "eliminating" competition is not always easy to discern even for the expert, and the layman may find it difficult to follow the reasoning behind the lawyer's advice.

Sometimes the business client will not accept the lawyer's advice even when he understands the reasoning. This, of course, is his privilege. His morals are a matter for his own conscience. He can do a civil wrong and pay for it in money damages. If he risks and escapes criminal penalties, there may be no side consequences.

The lawyer is not so free. Not only is he subject to the criminal and civil penalties applicable to everyone; he must be guided by a whole complex of additional rules. One serious false step and he is out of the profession altogether. No committee in the business world has the power of the grievance committee of the bar association. It can end a man's career.

Happily, few business clients knowingly request a lawyer to engage in forbidden acts. But a busi-

ness man with a blind spot may propose an illegal course that will be fatal for the lawyer. In such a situation, the lawyer must say "no," even if he loses the client.

The Bill Is Due

Having taken the longest possible time to say "no," the lawyer now sends his bill. Rarely does the client say, "By golly, it was worth every nickel of it." Neither lawyer nor client is satisfied with the other's attitude toward fees.

Some legal fees are unquestionably too large. What is less well known is that some are apologetically small. Except for a personal reaction, the business man has difficulty deciding whether the legal bill is a fair one. He has little knowledge of how the legal profession operates. A good business man knows the reasons for the cost of all his operations in great detail—except his legal expense. Here are some figures on the usual charges.

Hourly charges across the United States range from $10 to $50 an hour. Between $20 and $30 an hour will be the standard for a first-class well-staffed firm in a city with a population of a half-million or more. A client may pay less than $20 in some sections of the country and still get good service. In others, he may be making a poor bargain, though he may not find this out until he gets to court.

Where the charge is more than $50 an hour, even in New York, the client is probably paying for "red carpet" treatment rather than for skill. But it must be remembered that major litigation brings top prices, and so does complex corporation financial and tax work. Skilled advocates and genuinely expert corporation lawyers command a premium.

In judging costs, it also must be remembered that a law office cannot be run like a machine shop. Law practice is sporadic, and the peaks and valleys are hard to predict. What seem simple matters may grow into cumbersome cases. Complex disputes may be abruptly settled after dragging on for some time. But the law firm cannot lay off members of its professional staff when work is slack. To do so would be suicidal. It takes a long time to build a team of high-quality men with varying professional skills. In fact, the law firm seldom lays off even its clerical help.

TOMORROW'S LEGAL PROBLEMS?

The law grows and develops. Changing economic, ethical, and social concepts shape new statutes and affect interpretations of older laws. What was permissible or tolerated in the past may land the business man in difficulty today. Here, for example, are 23 propositions that recent decisions of various courts suggest may be possible trouble spots and so should be re-examined.

1. Acting as a director of two corporations that compete with each other or are customer and supplier.

2. Acquiring interests in other corporations, whether or not competitive, in order to achieve diversified operations or to gain tax advantages.

3. Distributing a bonus in ratio to the amount of stock held by each participant.

4. Paying directors who are not employees any sum in excess of the common fee for attending directors' meetings.

5. Paying the legal expenses incurred by a corporate officer in defending his employment and stock option contract.

6. Operating through subsidiaries in various states for presumed tax or other legal advantages.

7. Demanding that a union agree to eliminate strikes not approved by a majority of the employees.

8. Insisting on making a labor contract only with the plant local and not with the parent international body.

9. Making an agreement with a union freely selected by employees but not certified by the National Labor Relations Board.

10. Using an arbitration clause in a labor agreement to decide union liability for violating a no-strike clause.

11. Using an arbitration clause in an expiring labor agreement to decide a dispute over terms of the new contract.

12. Providing in a union agreement that employees may refuse to handle nonunion materials.

13. Entering into exclusive dealer arrangements and distribution contracts.

14. Purchasing or selling materials under exclusive requirements contracts with or without a required minimum.

15. Giving or taking discounts based on total annual purchases instead of on specific quantity orders.

16. Granting large customers lower prices over a period of time to meet competition where the seller's competitors follow the same practice.

17. Discriminating in price in relation to suits to recover three times the damage, where no monopoly or restraint-of-trade factor is involved.

18. Hiring research or development employees from competitors and then marketing competing products.

19. Hiring employees not engaged in research and development without an agreement on patentable ideas.

20. Selling or buying machinery made by a supplier to the unpatented design of a competitor of the buyer.

21. Manufacturing a product usable only as part of another manufacturer's product or process without knowing whether or not he has a patent.

22. Permitting distributors or customers to use a manufacturer's name or trademark in advertising without controlling the advertising copy.

23. Taking tax deductions for rent under a very long-term lease when the property will be acquired at the end of the lease for a nominal sum.

In a firm with three partners and perhaps three other lawyers with diverse skills, basic costs—salaries, rent, expense of maintaining an up-to-date law library, supplies, and so on—will run in the neighborhood of $50,000 to $60,000 a year. And the partners cannot spend all their time directly on income-producing work since they must take time to keep up with the subject matter. If each of the three partners is to make about $25,000 a year, they will each have to charge

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SMALL BUSINESS LOOKS AT ITSELF

Photograph from Lockwood, Kessler & Bartlett Inc.

Big business is undoubtedly getting bigger, and many people assume that this means that small business is getting smaller—in fact, approaching the vanishing point. To find out how much truth there is in this notion, DR&MI editors asked small business men themselves—a representative sample of manufacturers, wholesalers, retailers, and owners of service concerns—how they are progressing, what they expect in the future, and what they are doing to meet competition.

RICHARD SANZO

WHAT IS THE real status of small business today? Some observers say small business is foundering, and needs help; others that it faces extinction, and is beyond help. But is small business really thinking of cashing in its chips—or is it staking them hopefully on the future? What are the problems small business faces, and what is it doing to solve them?

"Friends" of small business, brooding endlessly about its "plight," have forecast a shaky future. They support their predictions by pointing to the growing concentration of big business, accelerating mergers, rising business failures. Others use statistics to emphasize that small business is "getting a decreasing share of the market," and argue that the Government should curb bigness.

So much commiseration has given some small business men inferiority complexes. For example, there is the head of a growing metals business who pauses periodically, in the midst of vigorous planning for expansion, to meditate on the hopelessness of it all—for other small businesses.

How true to life is the picture of despair? It may convince some outside critics, but has it convinced the subject of the portrait—the small business man himself? To find out, DR&MI recently conducted a survey among typical small concerns. Completed in September 1957, it covered a random cross-section of 420 small businesses in 42 principal cities in the country. These concerns included 70 manufacturing companies, 100 wholesale and retail companies, and 30 concerns in service trades. Typical annual sales ranged from $500,000 to $2 million for manufacturers; $500,000 to $1 million for wholesalers; $200,000 to $500,000 for retailers; and $50,000 to $100,000 for service concerns. There was also a random mix of all shades of financial condition: The survey covered companies that were meeting their bills comfortably and those that were running behind. The business men interviewed were, in a word, thoroughly typical of small business owners and managers. Each of them was asked, in an interview at his place of business, to discuss recent trends in his

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business, his prospects for future growth, his plans and problems, his strong and weak points, his needs, and the likelihood of his remaining in business.

Among the general impressions gained about small business from this survey, the most outstanding was this: Small business has not only prospered, but it is hopeful—frequently, buoyant and exuberant. More than four out of every five small businesses reported that they had grown in the last five to ten years—generally in terms of sales and earnings, though some measured the improvement in terms of number of employees, number of customers, size of physical establishments, expansion of territories served, or in improved efficiency.

While the small business men were not asked to state their rate of growth, many did so voluntarily. One department store reported: "Volume—up 300 per cent; profit—up 200 per cent; inventory—up 100 per cent; space—up 40 per cent." One man measured his growth, somewhat sardonically, "50 per cent volume—50 per cent inflation." More typical was the small business man who said: "Doubled plant facilities and have 75 per cent more people." Many mentioned the opportunities resulting from a rising population, new products, the greater purchasing power of consumers, and the results of technological research.

In the light of past accomplishment, the expectations of future growth expressed by these business men may or may not be surprising. A resounding 76.8 per cent of those interviewed believed that their businesses would continue to grow, and nearly all the rest felt they could maintain their present size. (Some 2.5 per cent had no opinion on this point, and only 3 per cent expected any contraction.)

Continuous expansion, incidentally, does not appeal to all small business men. Some of those who foresaw no further growth were happy at the prospect. "We don't want to get any bigger," said a tool manufacturer. A wholesaler of drugs and sundries wanted to avoid the complexity that might come with size. And the owner of a service business said: "My business is as large as I want it to be—I want time to enjoy my family."

These men, however, were a very small minority. Most of the small business men looked forward with eagerness to the opportunities they saw ahead. They believed the economic trends favored them and that they had the ability to take advantage of the trends. Many were spending money for advertising, designing new products, taking on new lines, expanding territories and opening branches, buying better equipment, and developing new methods—in general, exhibiting the dynamism characteristic of American business.

Looking to the Future

Eighty-two per cent viewed their prospects as "bright" or "good." And the optimists included men in all types of business: manufacturing, wholesaling, retailing, and service.

An air conditioning contractor in Los Angeles reported: "There is a large public demand for air conditioning. After demand is met, there will be a large need for service. New items are being introduced continually."

A furniture store owner in the same city based his anticipation of growth on "a new and better location, a better grade of merchandise, more personal service, better help, a new advertising campaign. Also we are expanding into a new area of the city."

Among the wholesalers were a number who announced that they were "vigorously pushing for new business," "expanding rapidly," or "adding a new warehouse," and who felt that "we can't miss so long as we have what people want at a price they want to pay."

Perhaps the most interesting growth expectations were expressed by manufacturers. Among these was a paint manufacturer in the Mid-West who commented: "We will expand for several years to come, dependent upon construction of new homes at the rate of one million starts annually." A manufacturer of store fixtures put it this way: "Our company has only skimmed the pros-

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The survey discussed in this article contained seven basic questions. The tables below and on pages 164 and 166 list these questions and the answers by percentage of respondents.

I. LOOKING BACKWARD, LOOKING FORWARD

In the last few years (say, 5 or 10 years) has your business grown, gone backward, or stood still?

	Mfrs.	Wholesalers	Retailers	Service Companies	Total
Has grown	84.5%	80.9%	75.9%	84.1%	80.9%
Has gone backward	4.7	3.4	9.0	5.8	6.0
Has stood still	10.8	15.7	15.1	10.1	13.1

In the coming years, will your business grow, go backward, or stand still?

It will grow	82.9%	83.3%	66.4%	76.5%	76.8%
It will go backwards	3.9	1.2	3.8	1.5	2.9
It will stand still	12.4	13.3	26.0	19.1	17.9
Don't know	0.8	2.2	3.8	2.9	2.4

II. REINS ON PROGRESS

If anything has held back your growth, what are the factors?

Competition	10.3%	13.5%	24.0%	14.0%	15.7%
Lack of capital and financing	12.4	9.0	9.6	14.1	11.1
Lack of capable personnel	6.6	7.9	8.0	9.4	7.7
Taxes	7.4	10.1	4.0	6.2	6.8
Inadequate facilities and equipment	7.4	5.6	8.8	0.0	6.3
Cost squeeze	2.9	9.0	1.6	3.1	3.9
Tight money	3.7	3.4	2.4	4.7	3.4
Nothing in particular	34.6	25.8	24.8	31.3	29.2
All other reasons*	14.7	15.7	16.8	17.2	15.9

*"All other reasons" include economic conditions, reduced levels of residential construction, strikes, neighborhood deterioration, reluctance to expand, illness in family, credit practices, and special local conditions.

THE NEGRO MARKET: A $16 BILLION SALES CHALLENGE

ROBERT S. LAVINE

As traditional barriers have begun to break down, Negroes have moved into higher-paid occupations and their purchasing power has mounted steadily. Yet some companies are letting this multi-billion-dollar market go by default, or unknowingly alienating it by practices that are easy to avoid.

INDUSTRY, which has been trying to teach business-like methods to government officials, could take a leaf from the hard-headed politician. A U.S. Senator, discussing the nation's first civil rights law in 80 years, recently commented: "It sounds brutal to say this, but there are only about 5 million farmers now and there are 17 million Negroes. That's why there's no farm legislation before us, and why we are struggling so hard with civil rights."

It's as simple as that. Officeholders have become aware of this powerful, politically maturing segment of the American population. The successful politician is keenly sensitive to the desires of his constituents. American industry needs the same foresight.

America's 17 million Negro citizens today represent $16 billion worth of purchasing power. Those who think they can get their share of this market without inviting it may not only be missing a lucrative opportunity, but actually chasing it away. The relatively few companies that have studied this market, that make a real effort to appeal to it, are scooping great ladles of cream off the top.

How rich is that "cream"? The $16 billion is take-home income—money ready to be spent on quality merchandise and services, money that is eager to be exchanged for anything that will build prestige and self-esteem. This money will be spent—for while his income has tripled since prewar years, the Negro's savings have dropped from 7 per cent to 4 per cent of his total income. The question is: From whom will the Negro buy?

"There's nothing like the good flavor of Camels! They've really got it!"
HAVE A REAL CIGARETTE...
Discover the difference between "just smoking" and Camels!
CAMEL

Advertisements depicting the Negro as a dignified citizen capable of buying the best for home and play or featuring "personal endorsements" help garner a large share of the Negro market for these companies. The alienating old-time stereotypes are now carefully avoided.

To get it in its proper perspective, this purchasing power is equal to that of Canada, or this country's entire export trade. And it is a market without the barriers of tariffs, languages, traditions, or customs.

It's not a hard market to sell. These Americans have the same wants and needs as the other nine-tenths. Only, they want the best, they want it now, and they'll pay top dollar for it.

The physical problem of telling them your story and selling them your product is relatively easy. For they are not evenly scattered over the country in a 1 to 10 ratio. They have become urbanized. More than 70 per cent of the urban Negroes are in 46 major cities. And, according to John H. Johnson, president of Johnson Publishing Co., Chicago (*Ebony, Jet, Tan*), "There are fourteen cities where it is impossible for a product to be tops in its field without Negro support." These are New York, Chicago, Philadelphia, Detroit, Washington, Baltimore, Los Angeles, St. Louis, Birmingham, Ala., New Orleans, Memphis, Atlanta, Cleveland,

and Houston. The Negroes in these and the other 32 key cities represent from 10 to 44 per cent of the total population.

Here is how that market has grown in just the past seven years, according to the U.S. Census Bureau: The Negro population in the Greater New York area has gone from about 8 per cent to 11 per cent; in Chicago, from about 11 per cent to nearly 20 per cent; in Philadelphia, which is a sort of "port of entry" for immigration from the South, from 13 per cent to almost 21 per cent; in Detroit, with its high-paying auto factories, from 11 per cent to a little under 20 per cent. Washington, with the lure of civil service jobs, has seen its Negro population increase from 23 per cent to 44 per cent; Baltimore is up from over 19 per cent to more than 29 per cent; St. Louis has grown from less

than 13 per cent to more than 27 per cent; New Orleans, one of the very few Southern cities with an increase in Negro population, has gone from 29 per cent to somewhat under 35 per cent; Cleveland is up from over 10 per cent to 22 per cent. The San Francisco-Oakland Bay Area went from 6 per cent to over 13 per cent; Los Angeles grew from 5 per cent to nearly 12 per cent.

This migratory shift has redistributed the Negro population remarkably since the war. Before that time fully two-thirds of all American Negroes were Southern farmers and farm workers; only one-sixth are today. Half are living in Southern cities, and one-third are in Northern cities. Since the Northern urban Negro earns four to five times what the Southern Negro farmer does, he is the elite—the bull's-eye on the sales target.

For instance, according to a Los Angeles newspaper survey, the Negro buying power in the Greater Los Angeles area is more than $217 million, and home ownership is up 200 per cent since 1940. "The Los Angeles Negro," said the paper, "is moving constantly into occupations of higher incomes, diversified employment, and attendant security; the ever-growing middle class has a widened potential market." More than 150,000 are employed, averaging 1.2 persons per household. One out of every three newcomers since 1950 has been a Negro.

It's the same story in other large cities. Marketing studies reveal that in the California's Bay Area Negroes earn more than $1 million a day, and 80 per cent of it goes for consumer goods and services. New York Negroes spend $250 million on food alone each year. A third of every purchasing dollar in Birmingham comes from Negroes. In the nation's capital they spend over $400 million a year, and in Baltimore the Negro population represents a $285 million market.

Who Are the Pacesetters?

Experts in this field believe that unlike the white, whose standing in the community often depends on his family background as well as his wealth, the Negro is judged by his occupation, education, income, standard of living (material possessions), and public behavior.

Industry has one decided advantage in appealing to this market. Negro consumers have a tendency to "follow the leader." If a company can demonstrate that it sells the envied and highly respected top 5 per cent, it has a good chance of getting a major portion of the rest.

Even though there is still a tremendous gap between white and Negro income—about 81 per cent of Negro families have a net income (after taxes) of less than $4,000 as against 48 per cent of the whites—the Negro has tripled his prewar earnings, and increased them more than 60 per cent in just the past ten years. The median Negro family income is about $3,700 and is rising.

Not only are there more employment opportunities for Negroes, but better and higher-paying ones. Since the war, their white collar jobs have increased by about 230 per cent, there are about 90 per cent more Negroes in sales, nearly 80 per cent more are craftsmen and foremen, and one-third more professional, technical, and managerial employees, the Department of Labor reports.

Preparation was needed for these advancements in occupation. Since earning power is closely related to education, the future looks bright. The Census Bureau reports that although one-third of the Negroes over 65 are illiterate, 96 per cent of those between 14 and 24 can read and write. And despite lack of educational opportunities, Negro enrollment in universities increases yearly.

Also, the Negroes' needs and desires are those of a vigorous, young market. Nearly half are under 25,

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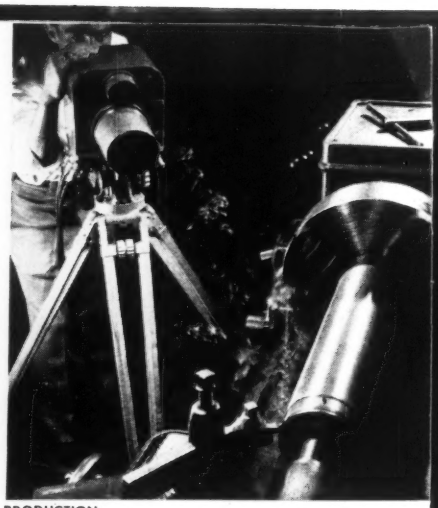
MAINTENANCE . . .

RESEARCH . . .



PRODUCTION . . .

INFRARED:

INDUSTRY'S LATEST PRODIGY

MELVIN MANDELL, *Industrial Editor*

THERE'S A NEW, important dollar-saver on the industrial horizon. Infrared may provide easier answers to many of industry's problems: in product development, process control, quality control, and maintenance.

Industrial applications of infrared for analysis and heat detection have not received much publicity for the simple reason that military uses have been getting all the headlines. The Armed Forces have, in effect, rediscovered the infrared spectrum. No one outside the Services knows the budgets, of course, but knowledgeable engineers estimate that the military is spending about $100 million yearly on IR missile guidance systems and long-range IR aerial detectors.

Without the stimulation of the military program, leading technologists in infrared agree, these industrial instruments wouldn't have reached their present state of refinement. All the infrared devices have benefited from the improved sensing elements developed for defense requirements, and the infrared camera was actually designed for military use. Only the rise in infrared spectrometry in the research laboratory has been less dependent on the military effort and more closely tied to the current boom in all half-dozen spectroscopic techniques. (Since the use of infrared heating equipment is familiar in industry, it will not be discussed here.)

Radio	Civil Communications	Aerial Navigation	Airborne Radar	**Infrared**	Visible Light	Ultraviolet	X-rays (soft)	X-rays (hard)	Gamma Rays

What is infrared?

One of the most basic of all physical phenomena is electromagnetic radiation, which is propagated in wave-like fashion. Everything in nature generates some of this radiation, but the only part that can be sensed directly by human beings is light and heat. Electromagnetic radiation is characterized by frequency and wavelength, which are in inverse relationship to each other—the higher the frequency, the shorter the wavelength. Common broadcast radio uses comparatively low frequency—long wavelength radiation of around 1 million cycles per second and 1 meter in wavelength. The electromagnetic spectrum is used for broadcast or radar purposes right up to the edge of the infrared region.

Beyond the infrared spectrum, which is characterized by wavelengths measured in terms of the micron, about 1/50,000 inch, is visible light; then come ultraviolet light, soft X-rays, hard X-rays, and gamma rays, in that order.

Infrared has some of the properties of light—it can be focused with mirrors and lenses, yet it can pass through some opaque materials, such as silicon and germanium, in the same way radar waves do.

Every object above absolute zero (-273.1° C) generates infrared waves. All the heat of the sun reaches us as infrared radiation, and we can sense it with our skin. Most objects do not throw off enough infrared to be felt by human beings, but detectors are now available that can sense an object only a few fractions of a degree hotter than its surroundings at distances of many miles. Hence infrared detectors have found many military and industrial applications. The former are classified; the latter are discussed here.

Three infrared instruments are shown in use here. *Left:* A U.S. Steel maintenance technician operates an Evaporograph to check the condition of the bearings on a giant rolling mill. This Baird-Atomic infrared camera is used throughout the plant to check blast furnaces, open hearths, and coke ovens. *Center:* A General Electric physical chemist loads a sample into a Perkin-Elmer infrared spectrophotometer that has a special attachment for handling extremely small unknowns. He is attempting to find the effects of gases on small chemical groups on the surfaces. *Right:* An engineer aims a Barnes infrared pyrometer at the point of contact of a lathe cutting tool and stock to measure and record temperature. Faster cutting speeds and improved tool design could be the result.

During World War II both the Germans and the Allied Forces used detection devices that depended on reflected infrared. Later versions of these "snooperscopes" are still used by industry, largely to guard against prowlers, but the main military interest is now in "passive" equipment that depends on the natural IR radiation given off by every object. Similarly, the most exciting IR developments in industrial detection are passive—the instruments do not have to send out infrared to "see" something.

The Infrared Camera

The infrared camera, which, in effect, converts heat to light, can be used wherever heat distribution is important. When one spot or object in the field of view is hotter or colder than the surroundings, and finding the spot is important, the IR camera can do the job.

The first type of IR camera, the Evaporograph, was developed about five years ago by Baird-Atomic, Cambridge, Mass., and declassified two years ago, but so far the company has sold fewer than 100 of the instruments to industry.

The Evaporograph is a completely optical system that produces the image on a thin film of condensed oil. It can reveal temperature differences down to 1° C. Depending upon the intensity of the source of heat, it produces an image in fractions of a second up to several seconds, a very slow "shutter speed" compared to conventional cameras. It can make "thermal images" of objects miles away.

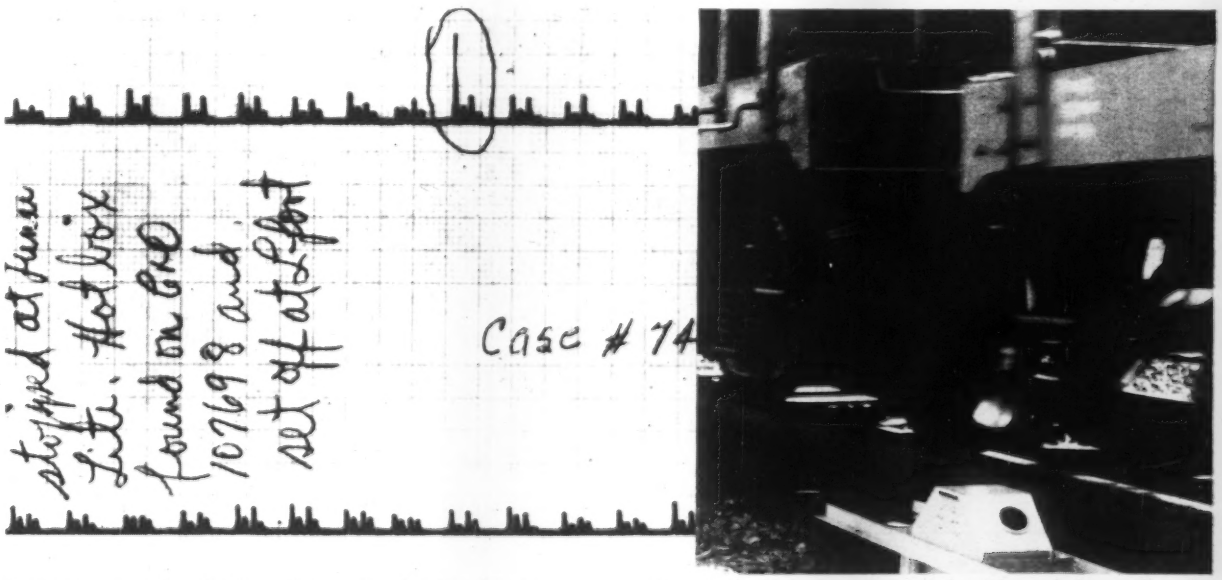
The Evaporograph now has a competitor, the scanning-type infrared camera. Unlike the Evaporograph, which produces the image all at once, the scanning camera builds up the picture in a series of horizontal or vertical lines (see the photo on the next page).

Where TV cameras scan in millionths of a second electronically, the early scan-type cameras take twelve to fourteen minutes to scan mechanically, but the latest (still classified) types scan in fractions of a second. If scanning speed continues to rise, there is good reason to believe that an infrared television camera could be produced. One immediate application would be study of continuously changing heat patterns. Diamond Power Specialties of Lancaster, Ohio, already makes a TV pick-up tube that is sensitive in the IR region. If the TV tube can be made a good deal more sensitive to infrared, we will be close to an IR television system.

Barnes Engineering in Stamford, Conn., and Servo Corporation in New Hyde Park, N.Y., are the companies known to produce scanning cameras for the military; and there are others that are still keeping the work confidential. Undoubtedly, these companies will soon be allowed to sell their cameras to industry. When they do, the more complicated scanning camera could very well cost twice as much as the Evaporograph, which is sold in two models at $9,500 and $12,500. However, the scanning camera can reveal temperature differences down to 0.02° C with resolution comparable to that of photography.

Since the infrared cameras now available to industry do not produce instantaneous pictures, they cannot study transient or rapidly changing phenomena. However, they can depict stable heat distribution in a moving object, and one tire manufacturer is using an IR camera to study the heat distribution in a tire rotating at speeds equivalent to 100 mph on the road.

Other possible applications would be to reveal the heat distribution in



As the train roars by, the Servo Corporation hot-box detectors on both sides of the track check each car bearing for overheating and send signals to a nearby recorder. The actual record at the left indicates that a right wheel bearing on the third car was hot.

working cutting tools and for nondestructive testing.

For the power plant operator the infrared camera may become practically indispensable. It can easily reveal corroded or dirty connections; faults in furnace walls; overloaded or faulty switches, bus bars, or circuit breakers; or coal piles on the verge of spontaneous combustion.

If a furnace has a slightly hotter spot on the outside, there is a good possibility that some refractory bricks have been eaten away by the corrosive products of combustion. If the bricks are not replaced quickly, the acids will penetrate behind the fire-brick wall—and eventually cause it to collapse.

The IR camera can also be used in an oil tank farm to monitor liquid levels in all the tanks from a central point, because the oil inside is warm enough to heat the outside of the tank slightly.

Because the various IR cameras were designed to be carried in jeeps or airplanes, they are rugged enough for plant use. And the run-of-the-mill plant maintenance craftsman can learn to operate one in less than a day. However, it takes an engineer to interpret the picture and make quantitative measurements.

Baird-Atomic makes it very easy for a manufacturer to decide whether or not he can use an IR camera. It will split the cost of evaluating an application, and rent the camera out by the month.

What the small manufacturer may need, however, is a service that will make thermal images at regular intervals or on a one-shot basis. This will probably come later when the full potential of the device is realized.

A thermal image of a motorcyclist made with a Barnes scan-type infrared camera. The wheels and motor show up as hottest, the handlebars as coldest, the driver as varying somewhere between these two extremes.

Once a dangerous hot or cold spot in an operation has been discovered by an IR camera, it can be monitored against time with an IR pyrometer, an instrument made by both Servo Corporation and Barnes Engineering.

The infrared pyrometer, like the well-known optical pyrometer, measures temperature. But while the optical pyrometer can measure temperature only if the object is hot enough to glow, the IR pyrometer can measure down to room temperature. Since pyrometers need not be in contact with the object, they can measure inaccessible parts or parts in dangerous locations, such as fast-moving, irradiated, or high-voltage devices. Distance is no restriction—IR pyrometers have measured the temperature of the moon.

However, the IR pyrometer is not likely to replace the optical pyrometer at high temperatures because it is much more expensive, costing about $5,000.

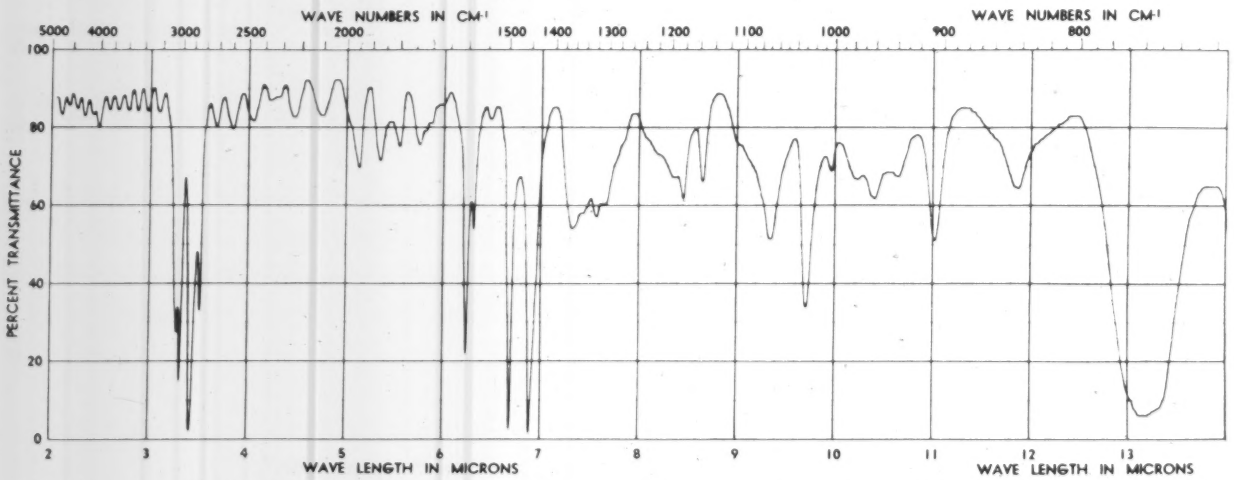
Pyrometers at Work

The electrical output of the IR pyrometer is actually being used to control production processes through a closed loop, although the most common use in plants is to monitor some stage. In one metalworking plant, a pyrometer controls the temperature to which a part is heated before it is quenched in oil. Before the pyrometer was installed, the rejection rate on this operation was 20 per cent; now it is zero.

At the Time, Inc., laboratory in Springdale, Conn., a pyrometer has monitored the temperature of paper as it rolls through an experimental rotary press at thousands of feet a minute. Similarly, textile mills could profit by determining what happens to cloth as it moves through the various stages of manufacture.

Although Servo Corporation has sold something over 100 pyrometers to industry since last year, little else can be told about how they are be-

continued on page 134


WAVE NUMBERS IN CM⁻¹
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WAVE NUMBERS IN CM⁻¹
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WAVE LENGTH IN MICRONS
WAVE LENGTH IN MICRONS

Infrared speeds up identification of unknowns by means of these spectrophotometer "profiles." The sharp valleys on this typical polystyrene profile, made on a Baird-Atomic instrument, indicate certain molecules that have high IR absorption at those frequencies.

FOURTEEN IMPORTANT RATIOS IN 12 RETAIL LINES

Dohnert Photograph from Devaney

For the past 25 years, the Fourteen Important Ratios by Roy A. Foulke, covering 70 lines of retailing, wholesaling, and manufacturing, and representing larger companies for the most part, have served as guides to management and to the credit judgment of banks and merchandise suppliers. Mr. Foulke has selected the fourteen ratios of most significance to financial management, covering the basic areas used in appraising a company's financial status.

The ratios for wholesaling and manufacturing will appear in the November and December issues, respectively.

WHAT IS THE proper approach to the application of the Fourteen Important Ratios, which are presented for twelve retail lines on the following page? Perhaps it seems strange that such a question should arise, considering that these annual studies have been compiled over a 25-year period.

From time to time, however, individual inquiries regarding some aspect of the ratios have suggested that the fundamental purposes for which the ratio studies are intended are not always clearly understood. For example, a financial analyst or a corporation treasurer will raise a query concerning relationships reflected by a company's balance sheet or a group of its financial statements. The overall financial position and trend of the concern appear healthy, but certain individual ratios do not conform to the medians compiled for the industry. The inquirer is frequently perplexed about the connotations implied by such variations from "typicality."

The problem is intensified by the important and growing role that financial and operating ratio studies have come to play in the techniques of financial statement analysis. The tendency to consider medians and interquartile ranges as standards and patterns of "typicality" has sometimes reached the point where these standards and patterns have been used as absolute standards of what is healthy or unsound.

It should be emphasized, therefore, that no single ratio can ever, of itself, serve as an exclusive criterion or indicator. The Fourteen Ratios are interrelated, and each has an important story to tell. It should be stressed just as strongly that no individual company's ratios have ever exactly matched each of the medians for its industry. No concern can ever be wholly typical—because no two concerns are alike in selling methods, sales territories, lines of products sold, equipment used, or in the abilities and personalities of management.

When financial ratios are compiled for a representative group of companies operating within an industry, certain broad industry patterns and characteristics do emerge. A concern whose entire Fourteen Ratios vary distinctly from the broad pattern within the industry may be relatively much worse off—or much better off—than the bulk of the concerns within the industry. Before an absolute conclusion is reached, however, it would be wise to carry the examination further. For comparisons of individual figures with those reflected by an industry pattern should lead to further questions, designed to show the reason for the variations between the concern's figures and those of others in the same or a similar line.

This, in short, is the nub of the entire matter. The Fourteen Important Ratios are not intended to be, and should not be regarded as absolute yardsticks. They should be treated as tools, as the basis for comparisons that may lead to study of the causes of financial balance or imbalance. The studies are also valuable in reflecting year-to-year changes and trends that have affected fi-

nancial relationships within a particular industry or line of business, and, consequently, the structure of a company's financial position and trend.

In the final analysis, therefore, these ratio studies are intended as a guide, not as a straitjacket or as a substitute for judgment. They help in measuring performance, in making decisions, and in locating potential trouble areas, or in emphasizing outstanding achievement. They present, too, a starting point for ascertaining what has happened to a particular concern, and why. END

14 IMPORTANT RATIOS IN 12 RETAIL LINES

Line of Business (and Number of Businesses)	Current Assets to Current Debt	Net Profits on Net Sales	Net Profits on Tangible Net Worth	Net Profits on Net Wkg. Cap.	Net Sales to Tangible Net Worth	Net Sales to Net Working Capital	Collection Period	Net Sales to Inventory	Fixed Assets to Tangible Net Worth	Current Debt to Tangible Net Worth	Total Debt to Tangible Net Worth	Inventory to Net Working Capital	Current Debt to Inventory	Funded Debts to Net Wkg. Capital
	Times	Per Cent	Per Cent	Per Cent	Times	Times	Days	Times	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
FOR 12 RETAIL LINES—1956—MEDIANS AND QUARTILES														
Clothing, Men's and Boys' (156)	5.60	5.36	11.88	17.44	3.48	4.54	**	4.9	6.1	17.5	45.5	68.1	34.9	16.5
	2.74	**2.51**	**5.75**	**7.49**	**2.57**	**3.20**	**	**3.6**	**13.4**	**47.6**	**89.6**	**89.6**	**60.2**	**35.6**
	1.97	0.71	2.37	2.50	1.80	2.28	**	2.7	35.7	78.2	154.3	120.6	89.9	64.3
Clothing, Men's and Women's (98)	7.20	7.35	9.74	22.49	3.44	4.03	**	6.9	9.4	12.9	39.3	43.4	29.8	14.1
	3.46	**2.92**	**7.26**	**11.13**	**2.63**	**3.21**	**	**4.7**	**16.0**	**31.7**	**67.7**	**69.5**	**60.6**	**24.3**
	2.49	1.16	4.19	4.69	1.56	2.68	**	3.1	35.3	51.5	126.3	108.1	88.4	51.3
Department Stores (449)	5.20	3.19	8.42	12.16	3.72	5.46	**	7.6	14.4	15.4	38.2	52.3	38.1	13.7
	3.61	**2.15**	**5.67**	**7.87**	**2.76**	**4.02**	**	**5.8**	**26.5**	**27.3**	**59.7**	**67.7**	**62.7**	**24.7**
	2.36	0.96	2.78	3.91	2.28	3.24	**	4.6	46.7	52.0	88.9	90.9	90.5	49.8
Dry Goods (79)	10.25	5.06	13.29	19.76	3.56	5.74	**	5.7	6.3	7.5	26.9	56.4	18.9	11.5
	5.35	**2.11**	**6.52**	**12.20**	**2.27**	**3.48**	**	**4.2**	**13.8**	**20.0**	**36.6**	**80.9**	**37.9**	**27.8**
	2.59	0.52	1.01	2.53	1.43	2.09	**	3.1	24.9	50.2	58.0	123.9	60.2	63.5
Furnishings, Men's (44)	10.26	7.27	17.13	31.51	3.61	3.74	**	3.6	3.9	10.5	41.5	64.7	20.5	23.3
	3.49	**4.72**	**8.04**	**9.64**	**2.13**	**2.61**	**	**3.1**	**13.2**	**27.9**	**75.9**	**91.4**	**44.6**	**32.0**
	1.85	1.80	2.88	2.95	1.55	1.83	**	2.6	31.8	64.4	141.3	152.8	68.2	68.8
Furniture, 50 Per Cent or More, Installment (129)	6.50	5.35	11.05	11.20	3.20	3.54	92	6.6	3.2	18.5	41.4	24.8	56.1	8.0
	3.58	**2.56**	**5.16**	**5.48**	**1.91**	**1.98**	**171**	**4.5**	**10.2**	**35.8**	**83.9**	**41.4**	**92.2**	**19.8**
	2.36	0.72	1.99	2.03	1.23	1.60	220	3.5	26.3	59.1	132.3	63.6	172.9	43.6
Groceries and Meats, Chain (54)	2.46	1.46	14.51	41.02	11.92	36.24	**	14.5	48.8	42.6	69.0	109.0	63.7	29.9
	1.75	**1.26**	**11.62**	**22.35**	**9.34**	**19.67**	**	**13.8**	**65.4**	**61.6**	**99.8**	**132.4**	**87.0**	**63.3**
	1.35	0.90	9.43	15.88	7.56	14.45	**	11.0	83.0	86.3	113.7	238.2	105.6	136.4
Groceries and Meats, Independent (48)	2.70	1.41	15.86	40.26	13.09	30.63	**	20.9	27.1	28.3	52.9	91.0	66.1	24.2
	1.79	**0.91**	**12.45**	**22.84**	**9.29**	**17.83**	**	**16.3**	**58.9**	**50.3**	**81.8**	**130.0**	**86.1**	**52.5**
	1.36	0.74	5.97	12.39	5.88	12.10	**	12.7	76.6	73.4	108.6	235.0	129.4	77.4
Hardware (44)	11.67	3.92	19.47	21.31	3.29	5.11	**	5.6	7.0	8.7	36.6	70.1	16.3	13.5
	4.03	**1.59**	**5.31**	**7.20**	**2.55**	**3.47**	**	**3.4**	**14.6**	**28.8**	**57.5**	**84.0**	**38.2**	**20.8**
	2.37	1.00	3.02	4.85	1.99	2.77	**	2.7	32.4	52.7	135.4	129.1	69.8	75.0
Lumber and Building Materials (130)	6.39	3.84	10.03	16.38	4.56	6.13	39	8.6	13.0	14.7	36.2	49.4	35.4	6.2
	3.24	**1.88**	**6.01**	**8.28**	**2.85**	**3.87**	**58**	**5.6**	**20.5**	**30.9**	**62.9**	**68.7**	**66.3**	**26.9**
	2.11	1.17	3.26	4.15	1.84	2.64	77	3.9	30.0	65.2	102.9	93.3	115.6	44.0
Shoes (78)	4.57	4.50	9.59	12.51	5.00	9.87	**	6.6	7.2	20.5	41.1	80.3	31.9	6.6
	2.98	**1.40**	**5.84**	**7.80**	**3.58**	**4.72**	**	**4.0**	**14.5**	**35.9**	**54.1**	**117.4**	**50.7**	**27.4**
	1.95	0.61	1.86	2.23	1.51	2.31	**	3.3	35.0	70.8	113.2	147.5	77.6	37.3
Women's Specialty Shops (203)	5.03	4.72	12.63	21.25	4.84	7.59	**	9.4	8.9	18.8	59.5	39.7	60.3	10.7
	2.50	**1.49**	**4.94**	**7.63**	**3.40**	**4.97**	**	**6.9**	**21.1**	**41.4**	**87.7**	**67.3**	**101.5**	**23.9**
	1.75	0.11	0.57	0.88	2.09	3.66	**	4.6	33.9	76.6	122.9	99.4	151.2	59.0
DEPARTMENT STORES—BY SIZE (TANGIBLE NET WORTH) CLASSES—MEDIANS ONLY														
1956 Under $200,000	**3.82**	**1.16**	**3.24**	**5.28**	**3.56**	**5.23**	**	**4.1**	**24.7**	**21.5**	**96.3**	**84.1**	**42.9**	**59.6**
1956 $200,000–$500,000	**3.53**	**2.42**	**5.63**	**6.41**	**2.50**	**3.61**	**	**4.9**	**23.7**	**26.4**	**64.7**	**66.8**	**62.7**	**35.9**
1956 Over $500,000	**3.50**	**2.14**	**6.00**	**8.67**	**2.69**	**4.05**	**	**6.4**	**28.1**	**29.3**	**55.5**	**63.3**	**70.6**	**22.4**

**Not computed; necessary information as to the division between cash sales and credit sales was available in too few cases to obtain an average collection period usable as a broad guide.

DEFINITIONS OF TERMS

THE RATIOS—The data used are based upon a representative sampling with a tangible net worth which only occasionally is below $50,000. . . . The center figure for each of the twelve lines is the median. The other two figures in each line are quartiles; for each ratio they indicate the upper and lower limits of the experiences of that half of the concerns whose ratios are nearest to the median. When any figures are listed in order according to their size, the median is the middle figure (same number of items from the top and the bottom) and the quartiles are the figures that are located one-quarter and three-quarters down the list.

COLLECTION PERIOD—The number of days that the total of trade accounts and notes receivable (including assigned accounts and discounted notes, if any) less reserves for bad debts, represents when compared with the annual net credit sales. Formula—divide the annual net credit sales by 365 days to obtain the average credit sales per day. Then divide the total of accounts and notes receivable (plus any discounted notes receivable) by the average credit sales per day to obtain the average collection period.

CURRENT ASSETS—Total of cash, accounts and notes receivable for the sales of merchandise in regular trade quarters less any reserves for bad debts, advances on merchandise, inventory less any reserves, listed securities when not in excess of market. State and municipal bonds not in excess of market, and United States Government securities.

CURRENT DEBT—Total of all liabilities due within one year from statement date including current payments on serial notes, mortgages, debentures, or other funded debts. This item also includes current reserves such as gross reserves for Federal income and excess profit taxes, reserves for contingencies set up for specific purposes, but does not include reserves for depreciation.

FIXED ASSETS—The sum of the cost value of land and the depreciated book values of buildings, leasehold improvements, fixtures, furniture, machinery, tools, and equipment.

FUNDED DEBT—Mortgages, bonds, debentures, gold notes, serial notes, or other obligations with maturity of more than one year from the statement date.

INVENTORY—The sum of raw material, material in process, and finished merchandise. It does not include supplies.

NET PROFITS—Profit after full depreciation on buildings, machinery, equipment, furniture, and other assets of a fixed nature; after reserves for Federal income and excess profit taxes; after reduction in the value of inventory to cost or market, whichever is lower, after charge-offs for bad debts; after miscellaneous reserves and adjustments; but before dividends or withdrawals.

NET SALES—The dollar volume of business transacted for 365 days net after deductions for returns, allowances, and discounts from gross sales.

NET SALES TO INVENTORY—The quotient obtained by dividing the annual net sales by the statement inventory. This quotient does not represent the actual physical turnover, which would be determined by reducing the annual net sales to the cost of goods sold, and then dividing the resulting figure by the statement inventory.

NET WORKING CAPITAL—The excess of the current assets over the current debt.

TANGIBLE NET WORTH—The sum of all outstanding preferred or preference stocks (if any) and outstanding common stocks, surplus, and undivided profits, less any intangible items in the assets, such as good-will, trademarks, patents, copyrights, leaseholds, mailing list, treasury stock, organization expenses, and underwriting discounts and expenses.

TURNOVER OF TANGIBLE NET WORTH—The quotient obtained by dividing annual net sales by tangible net worth.

TURNOVER OF NET WORKING CAPITAL—The quotient obtained by dividing annual net sales by net working capital.

Mr. John B. Fischer
CONTROLLER
C. A. Rowell Department Store
Philadelphia, Pennsylvania

"We value the fine quality of West Liquid Soaps"

"We had no idea that liquid soap could be highly economical and still be a pleasure to use — until we tried West Liquid Soap. It cleans gently with plenty of lather, leaving a very refreshing after-feel that pleases customers and employees alike," says MR. JOHN B. FISCHER, Controller for the C. A. Rowell Department Store, Philadelphia.

"Neatness is another important consideration. We find that West Liquid Soap is used without messiness or waste. Limited portions are cleanly dispensed from our modern stainless steel West Soaparatus System. Everyone is pleased with these features, all of which add up to high quality at low cost."

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☐ Please send your 16 page booklet, "Soap and Soap Equipment."
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Name.....

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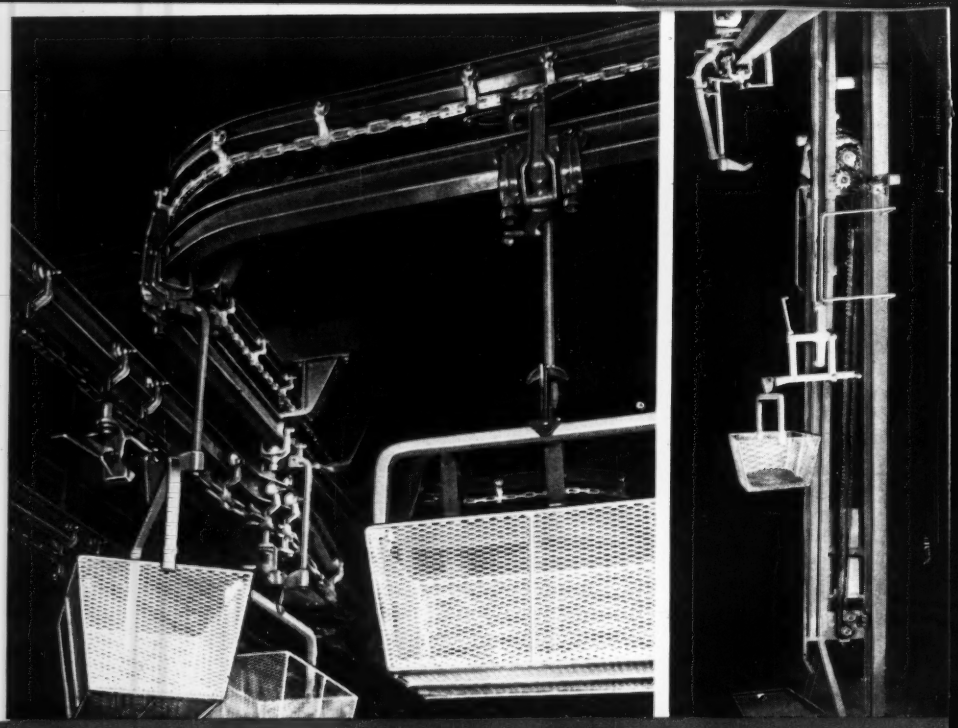
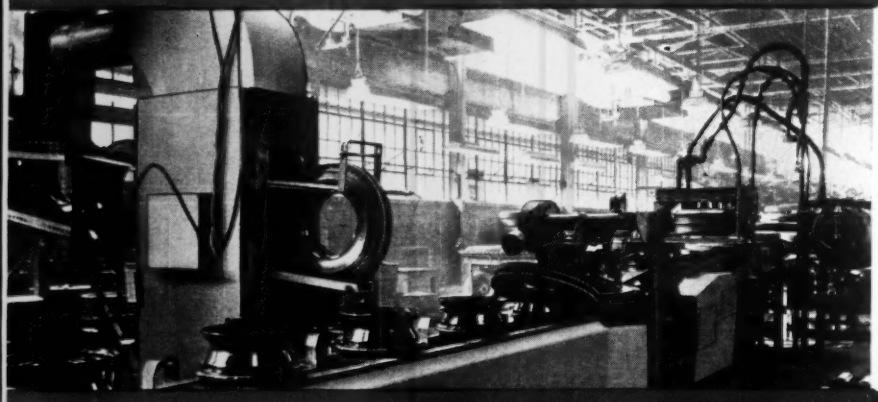
Mail this coupon with your letterhead to Dept. 1



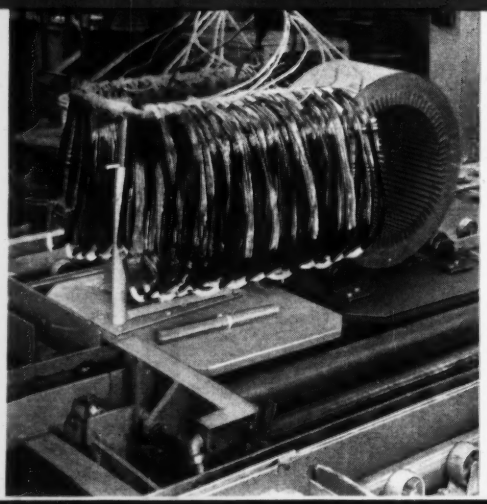
TRANS-FREE CONVEYOR
Automatic transfer from live line to free accomplished without physical handling. Some installations incorporate vertical elevators which allow all work transfer in unused overhead space.

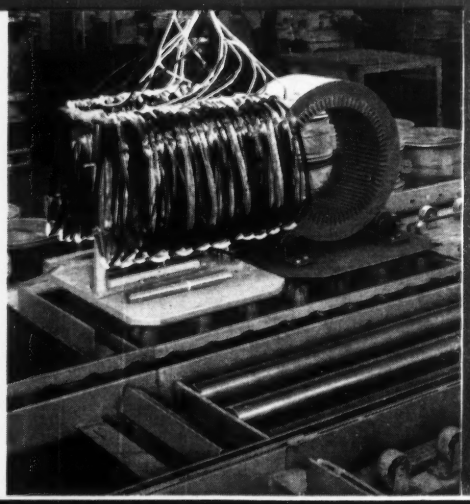
New Ideas by Allied for

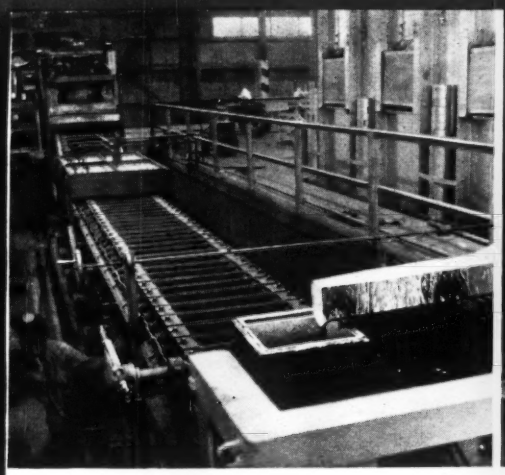


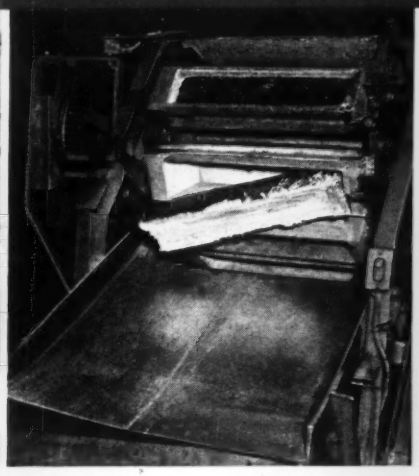
AUTOMATIC TIRE MOUNTER
Another Allied first, this mounter receives tires and wheels, soaps the bead and mounts the tire, and then *inflates and balances the wheel.* Wheels are untouched from beginning to end.

LIVE ROLLER TRANSFER
In this recent installation, pallet loads are maintained on a storage bank until a work station is freed. Load then travels to work station and is automatically transferred into work area without stopping the main conveyor. After processing, work is returned to the main conveyor with no time lost, no work stoppage for physical handling.







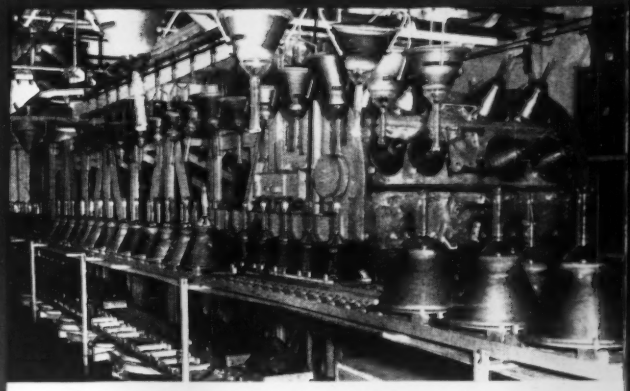


AUTOMATIC PIG STACKER — Prior to this Allied installation, ingots or pigs had to be stacked manually under hot and dangerous conditions by two 4-man teams who worked 15 minutes, then rested 15 minutes. With this automatic pig stacker, molds are poured, cooled while traveling down the conveyor line, shaken from the mold, and then stacked on pallets ready for forklift trucks, all automatically, completely without physical handling.

Automatic Product Handling

Allied has installed miles upon miles of overhead conveyors like many other conveyor companies. But length of installations alone is not the measure of the ability of a conveyor engineering team. The true measure is how they meet your individual product handling problems and solve them in a manner that will assure a maximum return on your investment. On these pages, Allied presents some of the cost-saving new ideas introduced by them in recent conveyor installations.

For more information about these and other Allied conveyor installations, please write on your letterhead.



TV SETTLER — Vibrations of the phosphorescent solution on a TV tube during settling causes ripples on the surface of the screen. Even the slightest quiver throughout this 40-foot conveyor would cause costly rejections. This Allied equipment was in operation within two months of the manufacturer's original request and has cut the rejection rate by 50% over the previous system of hand dipping.

ALLIED CONVEYORS

ALLIED STEEL AND CONVEYORS • DIVISION OF THE SPARTON CORP.

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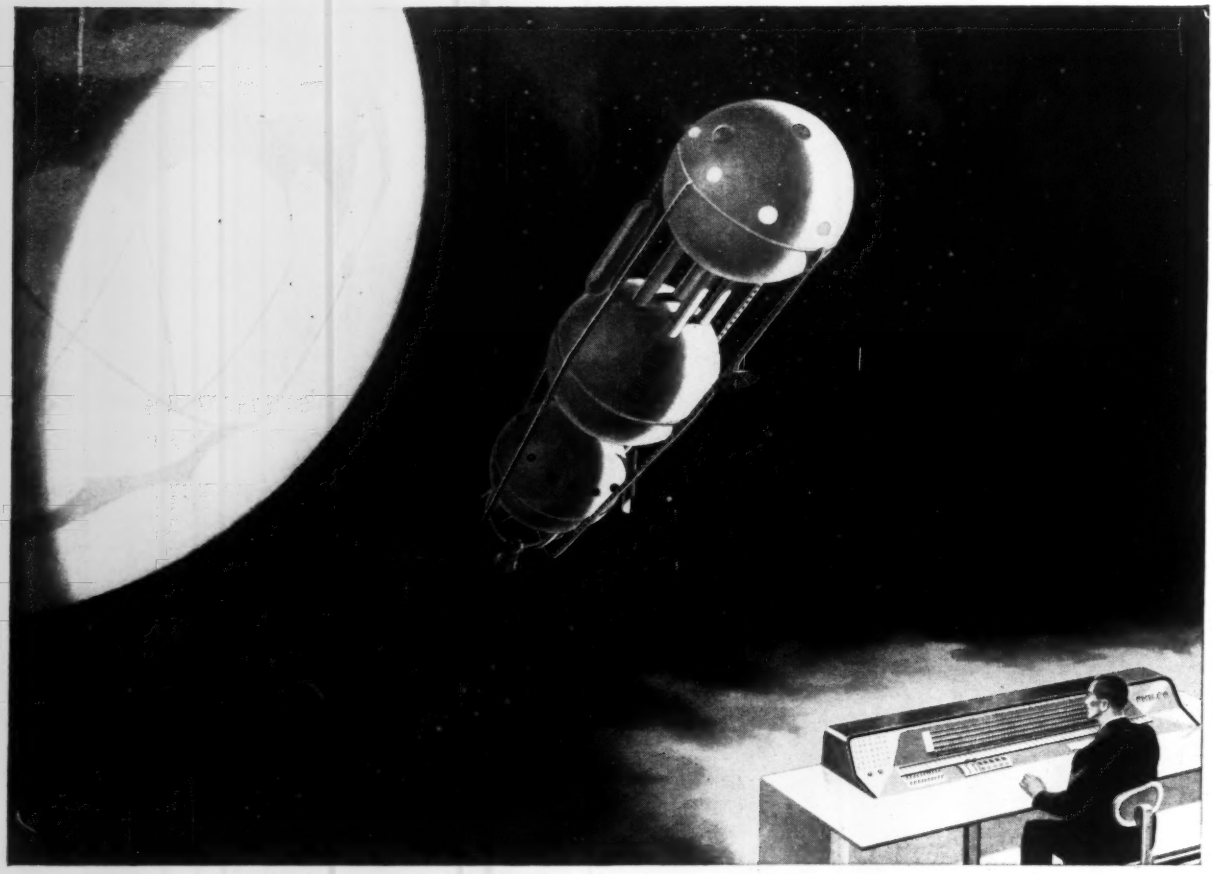

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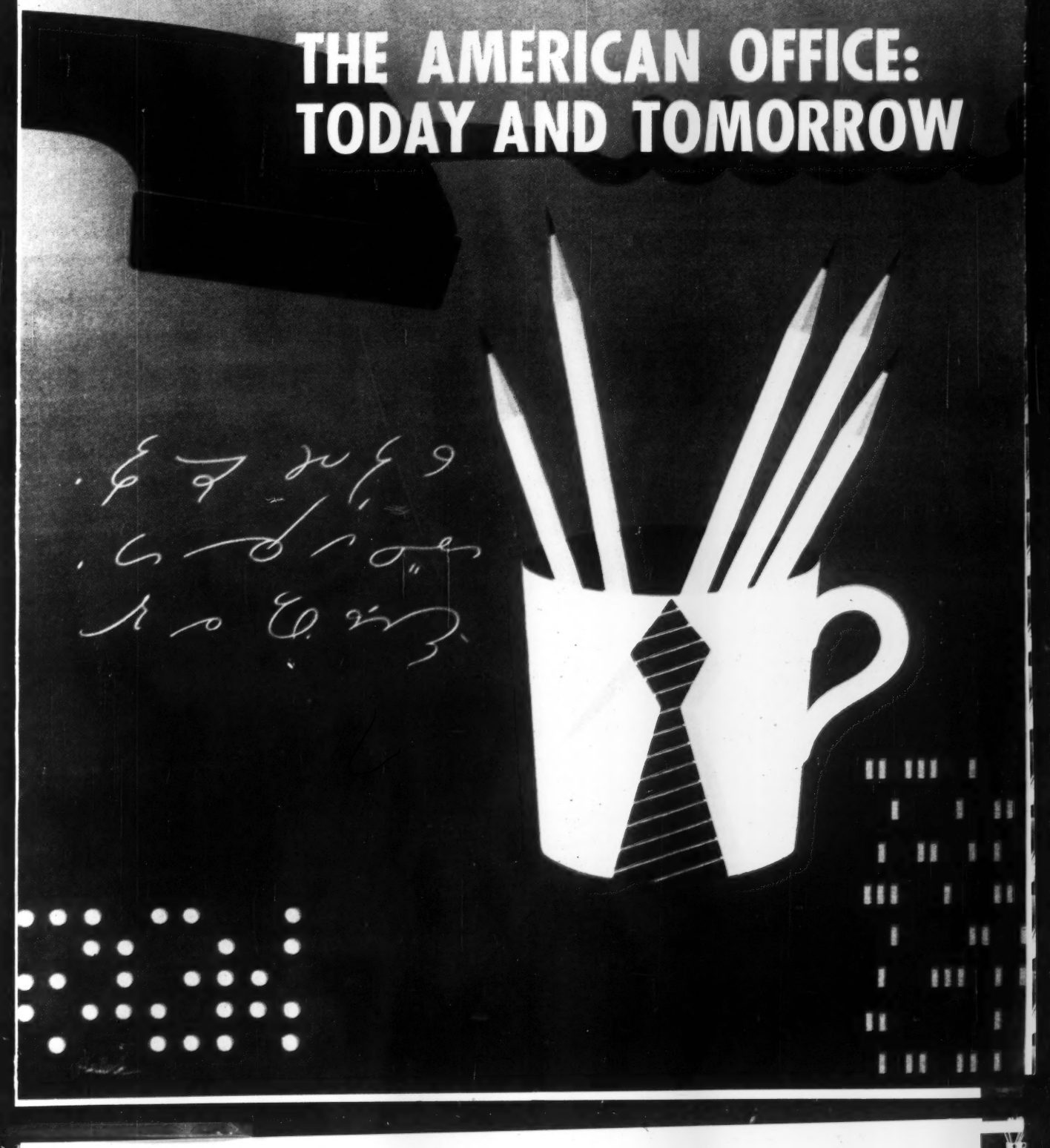
Extra Emphasis Feature

THE AMERICAN OFFICE: TODAY AND TOMORROW



PART I

With the big boom markets of the 1960's just ahead, executives are turning increasingly to improving the company nerve center as . . . . .

When completed in 1959, Southland Center, Dallas, with 42 stories, will be the tallest building west of the Mississippi. Welton Becket & Associates, architects.

MANAGEMENT TAKES A NEW LOOK AT THE OFFICE

THE MOST VALUABLE single commodity produced in America today is processed in one of the most neglected areas. The commodity is information—and the processing center is the American office.

Although most offices have been less responsive to the introduction of "scientific management" concepts than plant production areas, sweeping changes are taking place in the American office today. Change is under way because industry, like the nation itself, is growing increasingly complex and is demonstrating a growing, and apparently insatiable, appetite for information.

For without fast, up-to-date information on customers' specific needs and the best ways to satisfy them, the wheels of production would falter, and the other parts of the company would soon be out of balance. Despite many handicaps (see pages 96-104), office executives are doing their best to change the American office into a fast, responsive and smooth-running part of the corporate mechanism.

To find out how well equipped and arranged the typical office is to process data today, DR&MI asked management in a cross-section of business and industrial companies to take a

text continued on page 68

IN THIS SPECIAL FEATURE

The articles in this Extra Emphasis Feature were prepared under the direction of Senior Editor Thomas Kenny of the Dun's Review and Modern Industry staff.

INSIDE THE IMPROVED OFFICE 78

Photostories of offices that have developed new solutions for old problems. Here are dozens of ideas that you may be able to use.

HERE'S HOW THE FUTURE OFFICE WILL LOOK 89

What specific new equipment do executives want to improve the office? Several designers provide a peek at the office of 1967.

THE OFFICE CAN BE A COMEDY OF ERRORS 96

A roundup of actual mistakes companies make in planning new or remodeled offices. What is the proper approach in office planning?

WHERE OFFICE AUTOMATION STANDS 109

How deeply have electronic computers penetrated the office? What tasks are they being used for? What have been the results to date?

WE NEEDN'T DROWN IN PAPER 112

How can a company stem the rising flood of paperwork? Here are specific tips on cutting down paperwork, improving information.

HOW TIGHT IS THE "WHITE COLLAR SHORTAGE"? 120

A DR&MI survey of personnel departments across the nation points up the problems they are facing and their search for solutions.

HOW FARES THE WHITE-COLLARITE? 126

Is the white collar worker as badly off as some critics claim? Has inflation hurt him more than the blue collar worker in the plant?

HOW LARGE SHOULD YOUR OFFICE FORCE BE?

The answer depends on the business, of course, but comparisons may be useful. Here are fresh data for analyzing your staff needs.

Every company needs a big enough clerical staff to do the job of getting fresh information to management and satisfactory service to customers. But, as the data here indicate—in the first detailed study of this kind—many companies are getting those vital jobs done with white-collar forces that are very small in relation to their total number of employees.

Even within particular industries—the machinery industry offers a good example—there are wide variations in these ratios. While a high ratio of white collar to total employees is not always necessarily bad, it is a warning sign that outmoded data processing methods may be eating into profits. In some particular cases, the ratio has risen because semi-automated machines have cut the production workforce. And this in turn is an indication of the laggard pace of progress that prevails in many offices.

These percentages should not be considered rigid rules for each industry. Rather, they are the results of analyzing a sizable sample of companies—349—in industry and business, and should be used as indications of what is being achieved. The companies surveyed were in small, medium, and big business, with almost half falling in the first group.

As a company grows, paperwork usually grows even faster. While the smallest companies didn't always report the smallest ratios nor the giants always the highest ratios, this much can be said: the companies with the highest ratios in each industry were generally (about two times out of three) larger than the companies with the smallest ratios in the same industry.

For instance, producers of transportation equipment generally reported clerical forces of about 15 per cent, while one of the major automakers revealed a figure which was almost double the median—28 per cent.

Most of the surveyed companies clustered around the median in each industry, and again most of these were medium-sized companies. (The median is the midpoint in a group of figures arranged in order of size, bisecting the entire range so that an equal number fall above it and below it. It is often more useful than the simple arithmetical average, which can be pulled out of line and made non-representative by extreme figures that can fall at either end of the range.)

The companies in the miscellaneous manufacturing group produce bowling equipment, razors, pens, fishing tackle, toys, watch cases, notions, jewelry, brushes, marking devices, and caskets.

Office Workers* as a Percentage of Total Company Workforce

Manufacturing Companies	Number of Companies	Median Percentages	Range of Percentages
Food and Kindred Products	18	10.0	4.0 to 47.6
Textile Mill Products	16	9.9	2.3 to 19.1
Apparel and Related Products	10	9.4	3.0 to 33.3
Lumber and Products	3	18.0	15.6 to 25.0
Furniture and Fixtures	8	8.9	5.3 to 15.1
Paper and Allied Products	7	6.7	5.4 to 27.7
Printing and Publishing	9	31.9	5.0 to 100.0
Chemicals and Allied Products	22	16.0	6.3 to 31.2
Rubber Products	4	23.5	4.2 to 28.7
Leather and Leather Goods	6	6.4	3.2 to 8.3
Stone, Clay, and Glass Products	7	12.0	10.0 to 17.2
Primary Metal Industries	8	18.8	11.1 to 25.0
Fabricated Metal Products	32	15.8	4.3 to 41.7
Machinery (except electrical)	39	17.8	5.8 to 60.0
Electrical Machinery	31	18.0	2.5 to 46.3
Transportation Equipment	11	15.0	5.0 to 36.3
Instruments and Related Products	6	10.3	6.5 to 15.6
Petroleum and Coal Products	3	17.9	5.8 to 33.3
Miscellaneous Manufactures	16	12.5	6.0 to 34.4
Non-Manufacturing Companies			
Mining	3	4.7	3.2 to 11.9
Construction	5	4.0	3.0 to 23.3
Railroads	8	15.8	10.0 to 20.0
Trucking and Warehousing	6	18.3	7.3 to 28.0
Telephone Utilities	8	22.6	17.4 to 68.3
Electric, Gas, and Water Utilities	12	33.8	7.4 to 48.6
Wholesalers and Distributors	15	45.4	11.1 to 75.0
Retailers	11	16.7	3.3 to 33.3
Banks	17	90.9	78.9 to 100.0
Insurance Companies	8	84.7	58.9 to 100.0

*Clerical and supervisory employees

searching look at their own operations. The result is a detailed survey of 376 corporations which breaks like this:

Small (fewer than 500 employees)	48%
Medium (from 500 to 5,000 employees)	41%
Large (more than 5,000 employees)	11%

About 63 per cent of the 376 corporations are manufacturers.

Company after company reports consistent progress during the past five years in moving towards the mechanized office (for a bird's-eye view of their progress, see the table below). The new effort has not, primarily, been to displace clerical workers in order to achieve savings, but rather to handle a lot more paperwork without adding proportionately to the white-collar force. And most of the companies surveyed report that top management is indeed getting faster and more precise reports today than five years ago.

But however much office performance has been improved to date, there is still a long way to go. At least one group of management engineers estimates that white collar productivity is, at best, half of what it might be. Nevertheless, it is rising fast—probably faster than plant productivity, for there is more room for improvement. But the ratio of office to production workers is rising even faster. About fifteen years ago, there were 16 nonproduction workers for every 100 production employees in manufacturing. Now there are 28. So the company that fails to make strenuous efforts in the next five years to boost clerical productivity will find competition passing it by as a jet plane does a blimp.

How are companies improving their office operations? In addition to obvious changes in general comfort to attract clerical personnel and reduce turnover, companies are taking a new look at office layout to see if it conforms, as it should, to straight-line workflow. Barriers between departments are being lowered and sometimes removed, in order to achieve better integration of the entire data-handling job. The office is seen increasingly as something quite similar to a light-goods assembly plant. Large open areas are increasingly common.

Office services—such as duplicating machines, dictating equipment, files—are being centralized for economy and efficiency. Built-in services for employees are becoming the rule in new office buildings. In addition to the traditional cafeteria and lounge, some companies provide barber and beauty shops, bowling alleys, company-supervised stores, pick-up counters to leave shoes or watches for repair, and even swimming pools. The Connecticut General Life Insurance Company, which has a new building in the suburbs outside Hartford, Conn., is now arranging a shopping service for employees. They can leave their grocery list in the morning and pick up their bundles at quitting time.

These are a few of the inducements—not to mention fringe benefits—management is using to make the office a more comfortable place for the white-collar worker who spends nearly a fourth of his entire time in this home away from home.

The New Look Takes Shape

In fact, the American office is becoming more and more like the products of industry—colorful, light, comfortable, and ultra-convenient. Some of the specific features that are reshaping the American office:

Air conditioning: More and more companies today are doing something about the weather. Air-conditioning, they find, is paying off because it makes employees more comfortable, productive, and less inclined to fret about staying on the job until five o'clock when the mercury sizzles.

Movable walls: The increased flexibility that top management requires of office operations is reflected in the growing use of dividing walls. Departments can expend and contract as conditions change. When companies move toward decentralization—as they did a few years ago—and then back to centralization, walls can be shifted like stage props.

Duplicating equipment: In addition to electronic computers (see page 109) this is probably the fastest growing category of office hardware. As companies grow and management committees proliferate, more people have to be kept informed. So these machines are needed to avert the constant worry, "Does Frank have a copy of this?"

They can also break up bottlenecks in the workflow. In one office,

WHAT IS THE MODERN OFFICE MADE OF?

The figures on this checklist of items for the modern office indicate how many of the 376 surveyed companies now have or intend to buy each type of equipment or facility.

	Consider important for office efficiency	Now have	Expect to acquire within three years
Electric typewriters	310	320	51
Typewriters with punched-tape attachments	111	42	94
Accounting machines	312	311	53
Microfilm equipment	143	122	36
Visible records systems	231	249	23
Rotary files	95	111	19
Motorized files	40	33	16
Network dictating equipment	95	67	41
Penumatic transmission tubes	67	59	19
Vertical conveyor	24	26	7
Facsimile transmission systems	57	44	17
Closed-circuit television	12	6	14
Air conditioning	330	290	59
Acoustical walls or ceilings	280	246	47
Movable partitions	157	135	43
Modular furniture	65	49	28
Fluorescent lighting	309	321	27
Electric staplers	64	71	15
Electric pencil sharpeners	29	31	8
Background music	69	63	23
Vending machines	182	234	19

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FOR 77 YEARS, MANUFACTURERS OF THE WORLD'S FINEST BUSINESS EQUIPMENT, SYSTEMS AND FILING SUPPLIES

searching look at their own operations. The result is a detailed survey of 376 corporations which breaks like this:

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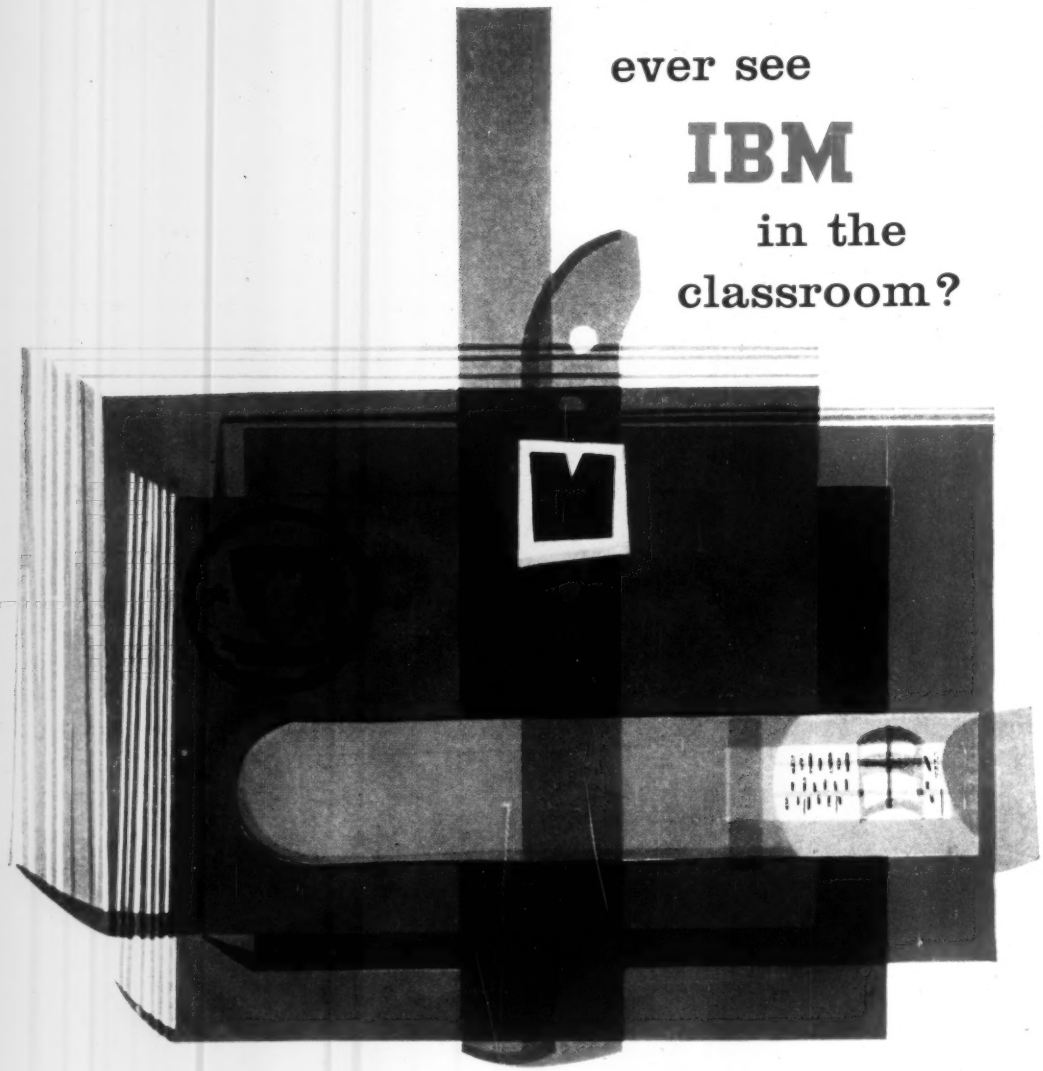

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customer complaints over slow deliveries were hurting sales. It turned out that newly received orders were backing up in the sales statistical department while detailed records by product, territory, customer, and salesman were compiled. The loss in sales and goodwill was certainly much larger than the cost of a duplicating machine which could have made quick copies of the orders.

Of course, many other features—fluorescent lighting, acoustical tiles, the better use of color—have done much to change the shape and character of the American office in recent decades.

Color Plays a Part

While the American office is much brighter and more colorful today than it was a decade or two ago, conservatism still plays a part in office decoration. There is, for example, considerable conformity in the choice of colors.

About 260 of the 376 companies surveyed used green on their office walls, and most of the others went in for tan or gray. However, a few mavericks were counted: seven reported blue walls, four pink, and three yellow. The overwhelming majority used white or a light shade of grey on ceilings, as lighting experts advise. But several offices reported dark colors.

Research into the effects of color on emotion indicates that yellow, rose, and light tans induce a feeling of warmth and stimulate activity. Psychologically, blue shades are calm and soothing, but they may also have a chilling and depressing effect. So most companies use green, which is relaxing without being enervating.

Some companies that have experimented with colors have come up with good results. In the general offices of National Distillers, the columns were painted bright red, yellow, and blue, while the walls stayed in workaday gray. Girls in the office get a lift from the vivid color splashes when they look up from their work.

Even the exterior of the American office is taking on bright hues. The Carnegie Plaza Building which will rise on the site of Carnegie Hall is to be bright red-baked enamel over steel. The Borg-Warner building in Chicago will be blue.

In the DR&MI survey, only one company in five uses a space allowance system (either formalized or

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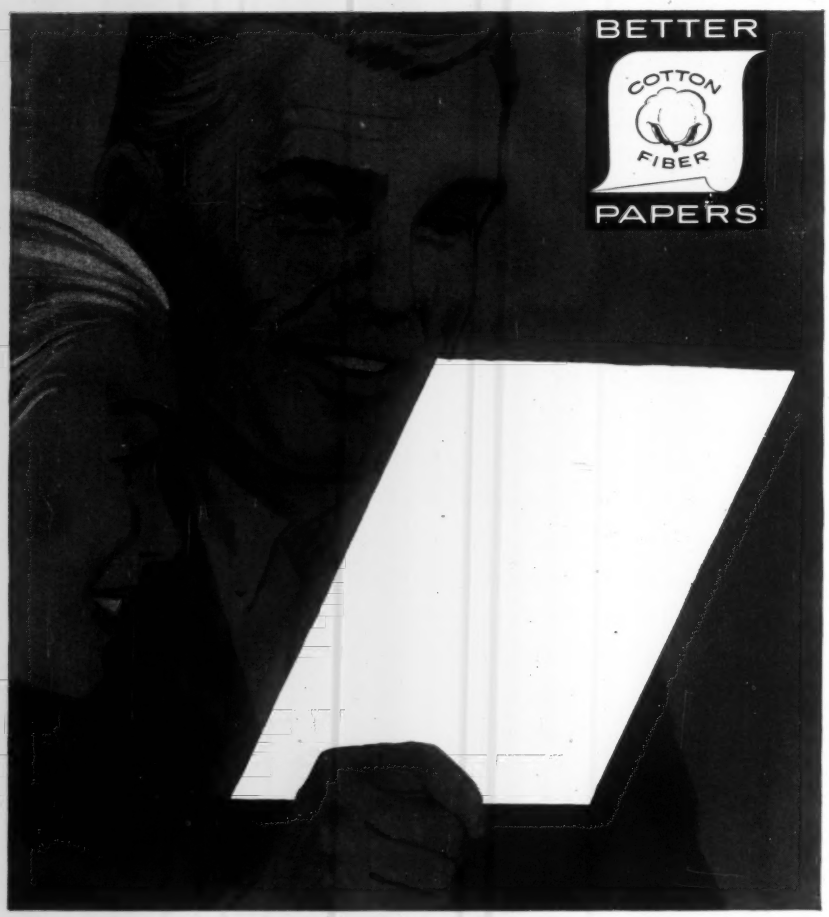

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rule-of-thumb) in its offices. Space allowances are more common in banks and insurance companies than in manufacturing.

By Function, Not Title

Space planning experts warn against rigid adherence to space allowances based on title. Function and equipment needs, they stress, should govern space allotments. Nevertheless, information on how companies allot space can serve as useful rough guides.

Here is how the 80 companies surveyed (broken down into manufacturers and non-manufacturers) with such systems allot space in terms of square feet:

POSITION	AREA ALLOTTED	
Typist	Median	Range
Mfg.	50	25 to 100
Non-mfg.	60	30 to 135
Accounting clerk		
Mfg.	60	25 to 100
Non-mfg.	60	30 to 138
Secretary		
Mfg.	60	25 to 150
Non-mfg.	75	35 to 175
Office supervisor		
Mfg.	100	36 to 160
Non-mfg.	114	45 to 325
Department head		
Mfg.	123	25 to 250
Non-mfg.	178	60 to 400

But whatever the specific space allowance, there is little doubt that private offices are on the rise. In about 80 per cent of the surveyed companies, private offices are more common than five years ago.

Who Rates an Office?

In the companies surveyed, private offices were about three times as common for department heads as for supervisors, and about nine times as prevalent as they were for professional workers.

Most of the companies attribute the rise in private offices to the need of the office's growing army of specialists and technical people for the privacy and quiet favorable to concentration. With increased mechanization, there has been an upgrading of clerical personnel as they are relieved from routine repetitive tasks, while the need for specialists in better-paying jobs has increased. As the controller of a major drug company remarked, "Today we have more chiefs and fewer Indians."

When do companies replace office equipment? Some companies keep typewriters clacking long after their useful economic life, while in other

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At Gutta Percha & Rubber, Limited, in Toronto, Canada, the office was plagued by the odors of rubber and processing chemicals. The firm manufactures a wide variety of industrial rubber products including conveyor belting, all types of industrial hose and extruded and molded rubber goods. But the air conditioning system sucked in all the odors from the operation and made working conditions difficult in the office building on the plant grounds.

Airkem was asked for help. An Osmetrol was installed right in the air conditioning system and the change was noticed immediately. Results were so good that management commented that the odor condition was remedied and working conditions were excellent. Airkem installations are generally made to treat less aggravating conditions, although there are Airkem odor counteractants to treat such annoying odors as fish, sulphur dioxide and even fried onions.

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The Dictabelt record—main reason why the Dictaphone Time-Master far outsells all other dictating machines.

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concerns equipment is discarded much too soon.

According to DR&MI's survey, replacement rates on typewriters range from two to seventeen years, with the median (midpoint) at seven years. The largest number—96 concerns—use them for ten years. The shortest replacement rate was reported by companies in textile manufactures, the longest in the primary metals industry.

Adding machines are generally used for a longer period. Here the number of years ranged from three (in the food industry) to 25 (railroads). Most companies used them for about ten years.

Dictating equipment is used for from three to 20 years, with most companies changing models after about ten years.

Accounting machines remain in offices anywhere from five to 20 years, averaging ten years.

Although many companies still favor wood furniture, an increased number today are buying metal desks, at least for those below the top-management echelon. And three times as many of the surveyed companies had bought only metal desks in the past three years as had bought only wood.

The average company made its metal- and wood-desk purchases in this period in about a 9-1 ratio. As might be expected, metal models were in special favor in metal-working and machinery industries.

TEMPERS AND TEMPERATURES

The old hassle about whether to raise or lower the office window is fast disappearing with the spread of air conditioning. But the temperature—real or imagined—can still be a sore spot in the office.

An insurance company had its offices done in a blue color scheme. When Winter came, the girls complained of being cold although the temperature was controlled at the same level as during previous Winters. Even when the temperature was raised to 75°, complaints continued and clerical output suffered.

Then the office was redone in green and yellow. The gripes vanished and never returned, even when the temperature was lowered to the old normal for the office.

In another company, complaints about the office temperature were finally appeased by installing dummy thermostats in each office department so that clerks could "control" the temperature in their own work areas.

During the next three years, this present lead of metal over wood is likely to widen, according to the buying plans of the surveyed companies.

However, wood desks still predominate in the executive suite, although tables—wood, of course—are replacing desks to some extent in the top executive offices.

Renting on the Rise

The practice of renting office machines has been spreading in the past decade. About 41 per cent of the companies report that they rent at least some of their equipment.

Most of the rented machines are tabulating equipment and large accounting machines, but sixteen companies report that they rent their typewriters, twelve lease adding machines and desk calculators, and several others rent postage meters and dictating equipment.

Surprisingly, three companies rent desks, and one small manufacturer of electrical machinery reports that all office equipment is leased. While this last practice is extremely rare, leasing is likely to broaden, at least in the immediate future, because of the current tight money market, particularly for small companies.

Of the surveyed companies now renting equipment, about two-thirds expect to turn increasingly to leased office machines in the future.

For every one of the surveyed companies that expects to be able to get along with a smaller office force in 1960 than today, seven are planning on longer clerical payrolls. Estimates of the rises range from as little as 1 per cent to as much as 100 per cent. The average expected gain is about 10 per cent. Companies hoping to reduce their number of clerical workers expect much smaller changes. Among this handful of companies are several that are making strides toward office automation.

Of the 376 companies, 58 plan to rent more space, and 121 have plans to construct new facilities with more office space. But, although about 60 per cent of the companies surveyed expect to have larger office forces in 1960, only about 40 per cent expect to have larger offices. So there will be a real need to take a long look at the present office if management hopes to get the most from the area used.

feature continued on page 78

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INSIDE THE IMPROVED OFFICE

THE MANAGERIAL urge to increase efficiency may not have penetrated the office as deeply as it has the factory production line. But new and fresh ideas for the office are bursting out all over. From here through page 84, you'll find a roundup of ideas that you can put to use in your own office set-up.

In improving the office, management is moved by several spurs:

- Simply to cut costs
- To improve efficiency while costs hold steady or rise
- To provide top management with better control information needed in a fast-changing competitive market.
- To attract competent clerical workers in a tight labor market.

This last may not be the most compelling reason, but judging by the sweeping changes taking place in decor and furnishings, it is certainly the most noticeable. Paradoxically, while offices are being increasingly thought of as production areas for processing data, they are becoming more comfortable and homelike. For companies are discovering the equation: P + C = E (competent Personnel plus Comfort equals Efficiency).

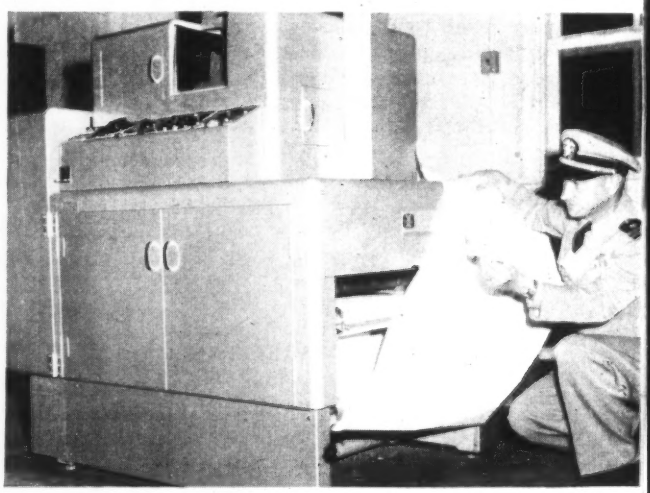
Stoller photograph

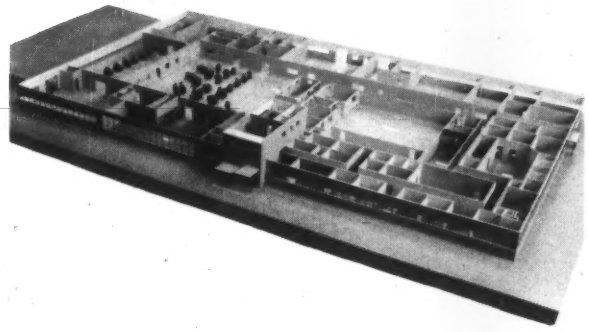
WALL-TO-WALL CARPETING in this Socony Mobil Oil (New York) secretarial pool combines with air and sound conditioning, background music, and other amenities to make feminine fingers fly.

THE GOLDFISH BOWL approach to private offices uses these unpolished plate glass partitions by Hauserman. Translucent, they provide privacy without cutting off the secretary from windows.

Big savings in engineering paperwork

The U.S. Navy has come up with a new system for the storage and reproduction of blueprints, which promises to save taxpayers several million dollars. In this Filmsort system, microfilms of blueprints are placed at apertures within punched cards. When needed, inexpensive dry electrostatic enlargements can be made quickly. After the blueprint copies are used, it is less expensive to throw them away than to store them, for other copies can be made quickly when needed. The savings in file storage, reproduction costs, and easy access are remarkable. Several large companies are already exploring this important innovation in engineering paperwork.





THIS THREE-DIMENSIONAL MODEL, 70 inches in length, helped Miniature Precision Bearings plan its office layout in detail.

COLORED CINDER BLOCK, framing the internal windows, simplifies the problem of finding offices and personnel, brightens halls.

HOW ONE COMPANY DESIGNED A NEW OFFICE ON A TIGHT BUDGET

THE DO-IT-YOURSELF approach to office design is paying off for a small manufacturer, Miniature Precision Bearings, Inc., of Keene, N.H. The new plant-office building, which houses 576 production and clerical workers, is a testament to Yankee frugality, proof that you can cut costs without cutting corners.

But to accomplish such a task, a great deal of detailed planning is needed. In addition to the traditional blueprints plus templates, MPB developed a three-dimensional scale model. With it management was able to determine not only the size and shape of individual offices and departments but also the exact decor to be used. The model was papered with the actual colors that would be used in the completed offices. From this model it was easy to select the complementing colors for floor tiles and draperies. Samples of the floor tile were cut and glued in the floor areas of the model. Thus the texture and feeling of the over-all layout came clear.

The model was also used after the building was completed to find space for expansion. When desk space was needed for the sales analysis section, the model pointed the way. It provided both an over-all sense of proportion and a bird's-eye view of space utilization.

In addition, the model is turning out to be useful in analyzing work flow and simplification procedures. This is important now when MPB is expanding and work flow must be adjusted to new interdepartmental relationships.

Among the cost-cutting features of the building:

The extensive use of cinder block for interior walls. About 78 per cent of the walls are cinder block, painted in bright colors to create warmth and liveliness. Color sets off each office area from the adjacent one. In fact, each office occupant was given his choice of colors—red, green, or yellow.

Stained plywood to simulate custom panelling. The plywood is stained dark walnut in the conference room, birch in the president's office, and pine in personnel.

Do-it-yourself conference tables and chairs. The expensive-looking conference chairs were purchased unfinished in New Hampshire and coated with black lacquer by the company. The conference table looks lush and custom-made, but it's really an old door lying flat.

But perhaps the greatest cost-cutting feature is the built-in flexibility that enables the company to shift quickly with the changes brought by expansion.

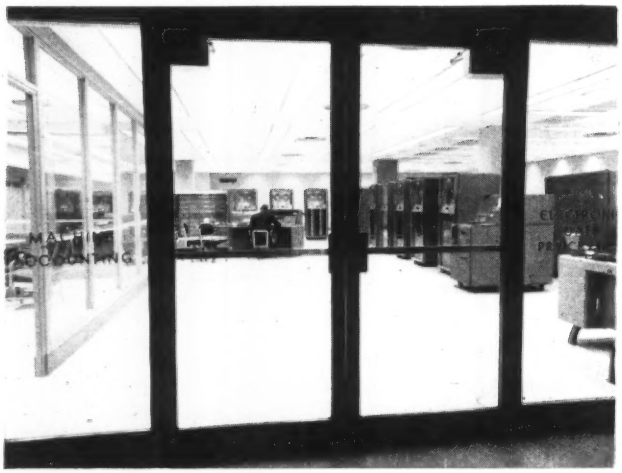
DOOR TURNED INTO TABLE is used when Executive Vice President W. M. Scranton confers with Sales Manager K. G. Broman.

Bright and sunny as all outdoors

Electronic computers may not make mistakes, but the people who feed them information, being human, are prone to error. To fend off fatigue, which occurs frequently in close detailed work, Consolidated Edison, New York utility company, has developed an imaginative use of lighting and color that makes its EDP section as warm and cheerful as an Indian Summer meadow. And it has enabled the company to make use of an internal office section without access to windows.

Although the light level is high (about 100 footcandles) the room is remarkable for its freedom from glare and shadow. The balanced illumination was achieved by the close cooperation of Con Edison engineers with Day-Brite Lighting of St. Louis. In their joint efforts they adhered to the recommendations of the Illuminating Engineering Society. Says a spokesman for Con Edison: "Although choice of colors is usually considered a prerogative of the interior decorator, it is vitally important for the lighting engineer. On this job, the lighting people were consulted on color selection, a practice that would greatly improve lighting installations if more generally adopted."

The colors used were salmon-pink, yellow, and green.



COLD STATISTICS are the daily product of this warm, colorful section of Consolidated Edison Company's old, remodeled building.

Although they are heat-generating, giant "brains" do create a sense of esthetic coldness.

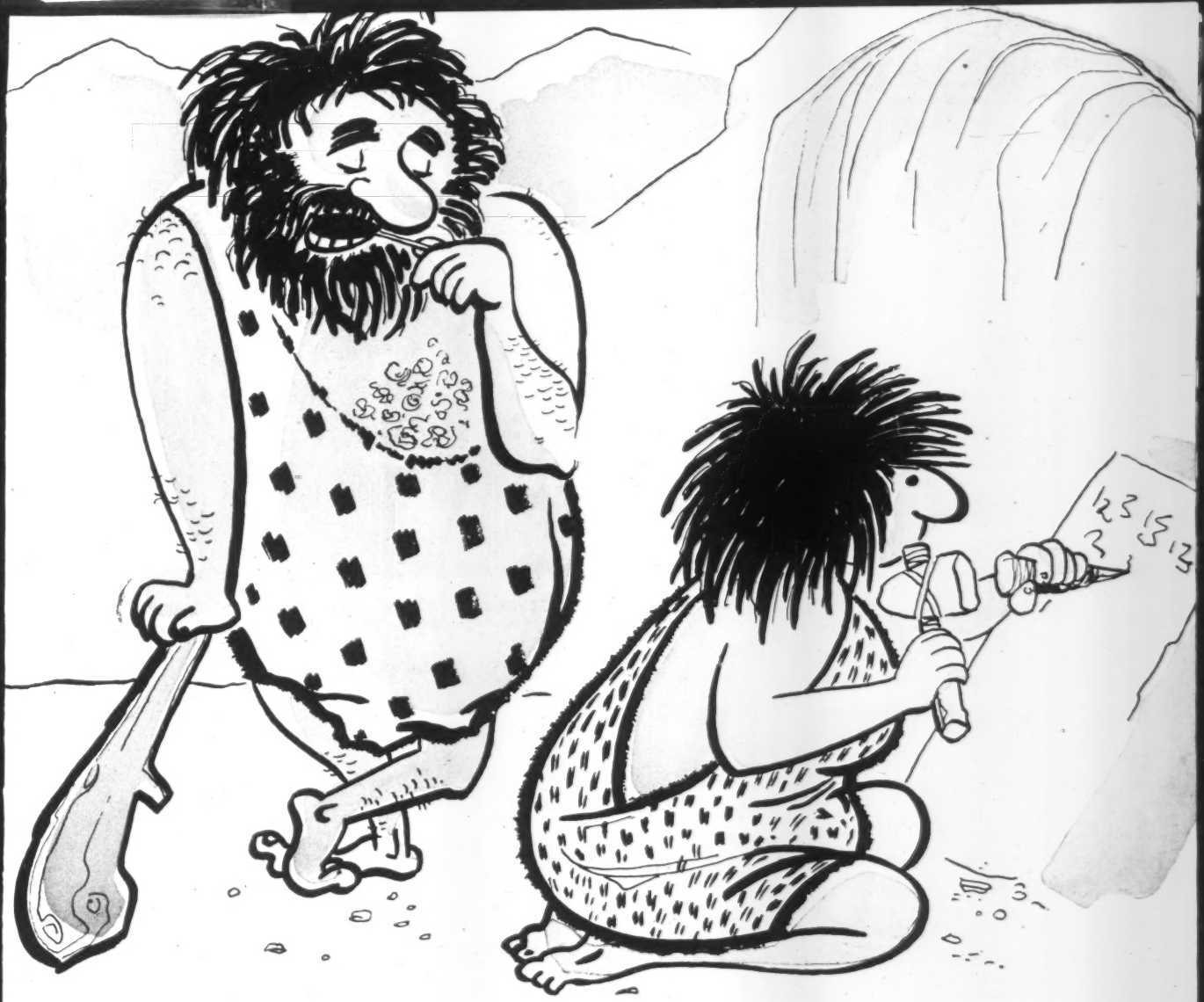
Typical of comments on the room's atmosphere is that of a computing machine operator: "No matter what the day's like outside, I feel like it's a Spring morning when I come into the room. And I still feel fresh at the end of the day."

Remote control dictation pays off handsomely

Only 30 girls handle all routine correspondence for about 300 people with heavy dictating loads at the new Connecticut General Life Insurance Co. building near Hartford, Conn. In addition, more than 1,000 other people use the remote-control telephone dictating system from time to time. Productivity is high: the girls specialize in this one function and can, with incentive bonuses, increase their base salaries by 50 per cent. There is a further economy to the company in not having to buy individual equipment for each dictator—equipment that may be in use only occasionally. Other companies—Socony Mobil, Standard-Vacuum, Shell Oil, to name a few—have also installed this new method of getting through stacks of correspondence.

BY PICKING UP his phone, an executive at Connecticut General Life Insurance Company is able to dictate replies to daily mail.

THE SECTION SUPERVISOR assigns dictated letter to a typist, along with any special instructions she receives from upstairs.



"This refers to yours of the 10th..."

Some people still hammer out communications one character at a time.

Others use DATAFAX—the fast Stewart-Warner electronic way to transmit all data over standard telephone lines.

Datafax transmits and records any material: correspondence, drawings, pictures, printed matter, even handwritten notes. And since copies are exact duplicate images of the original, chance for error is eliminated.

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Automatic transmission and recording eliminate need for full-time operator; recorders will even respond to transmissions sent after the office is closed for the day. Datafax also eliminates retyping, proofreading, intermediate handling, intransit delays—and their clerical costs. The clear, smudge-proof, permanent Datafax copy costs less than 2¢ for a letter-sized unit, plus pro rata line charge.

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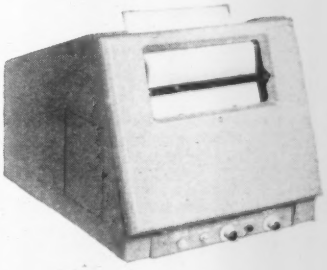
First, send for your copy of the free Datafax bulletin. Write: Stewart-Warner Electronics, Dept. 45, 1300 No. Kostner Ave., Chicago 51, Illinois.



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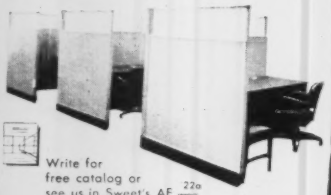

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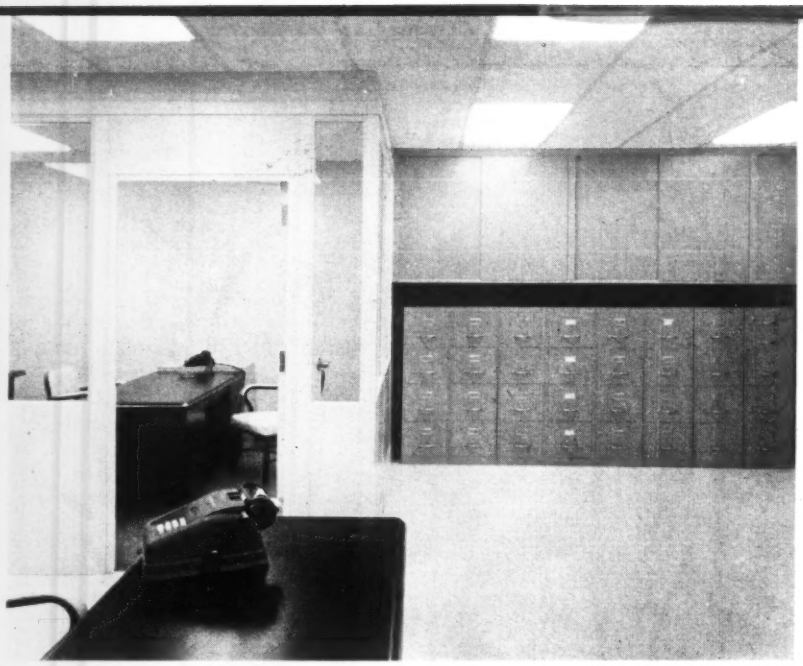
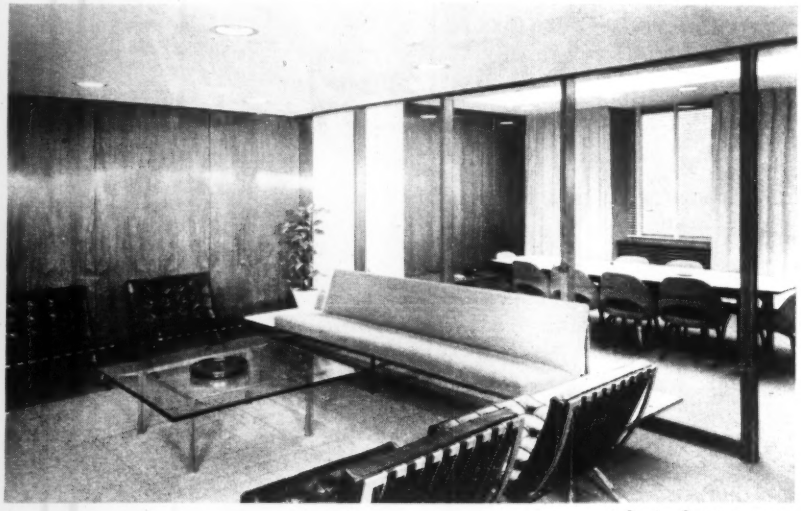


Michael Saphier Associates, Inc.

UNUSED SPACE ABOVE FILES can add to the cost burden, but Herbert Charles & Co., New York, turns it into storage area while leaving the tops of the files clear to serve as shelves.



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VESTIBULE CONFERENCE ROOM is proving an executive time-saver in a large paper company. Executives talk to visitors here, have no trouble cutting short too-lengthy interviews.

ROUND BUILDINGS are almost as rare as square wheels. But Capitol Records Tower, Los Angeles, gives more-than-usual office space compared with total building area, saves steps.

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Designs for Business, Inc.

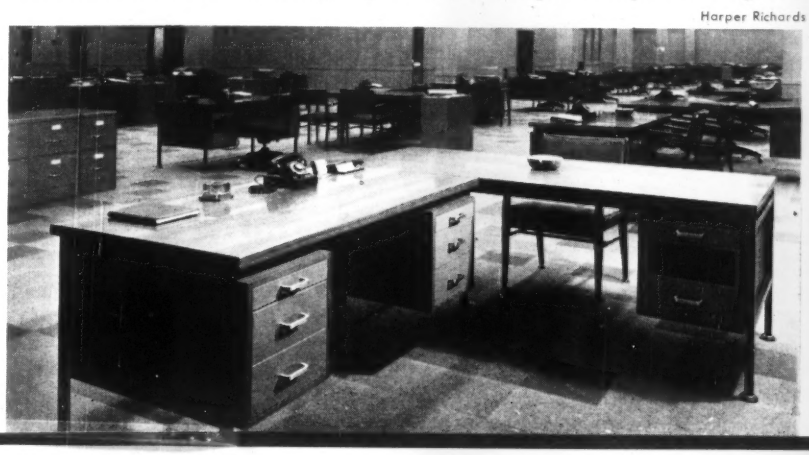
SNAKE-LIKE CONVEYOR in eight-floor offices of M. Lowenstein & Sons, New York textile firm, ties sections horizontally and vertically, cuts new-order processing time 90 per cent.

J. Gordon Carr & Associates

SINCE BOARD ROOM at Columbian Carbon, New York, is not in constant use, no window space was devoted to it. Generous use of glass paneling creates feeling of light, spaciousness.

SPECIALLY DESIGNED desks with Formica tops and built-in wastebaskets add to uncluttered look at Jewel Tea Co., Chicago. Open work areas help to tie departments together.

Harper Richards



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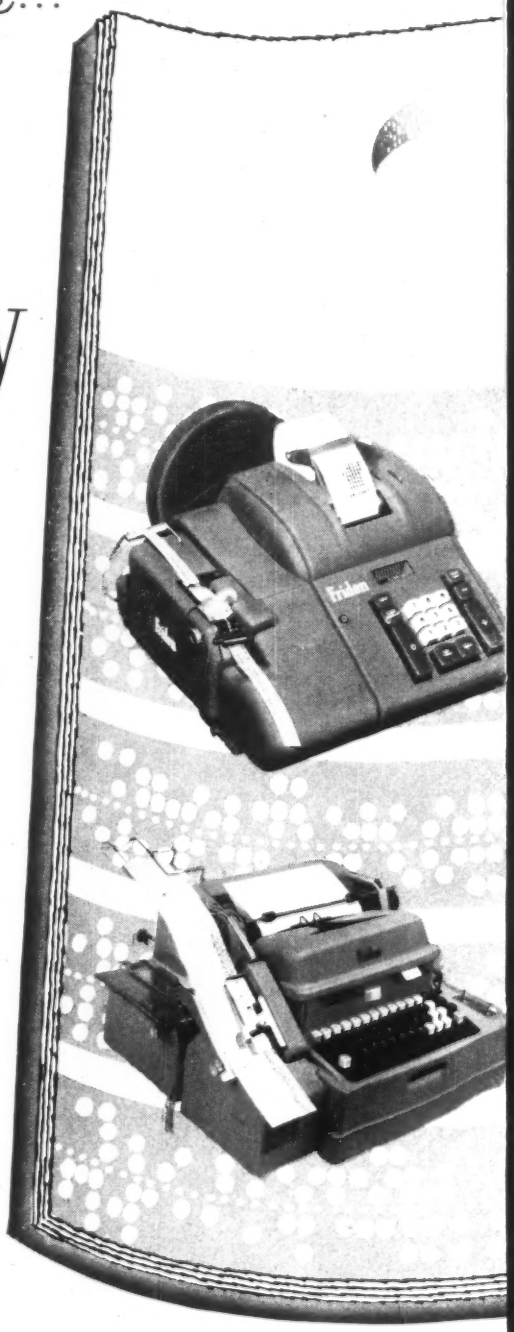

IDP — Integrated Data Processing — is one automatic Friden office machine talking to another... and another and another... in a code language common to them all... straight through from data origination and interpretation to final filing.

It is the functional flow of *punched tape* giving and taking orders. Tape enables even small and medium-size businesses to automatize repetitive figure-work routines... eliminating human errors and reducing time costs hugely.

Friden is the leader in this new era of office efficiency because Friden creates the Tape-Talk machines that make possible the new automated systems. Only a few of these machines can be presented here. Many more Friden Tape-Talk units are available to meet specialized data integration needs. Individually, or as part of a system, each machine quickly pays for itself.

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Friden

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Friden Add-Punch®

is the 10-key adding and listing machine with tape punch mechanism. A key IDP unit, the Add-Punch "writes" punched tape while printing on adding machine tape. The punched tape can be interpreted by other similarly-equipped machines. Typical Add-Punch functions include recording of retail sales, sales audit, production and inventory control, and coding statistical data.

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Friden Computyper®

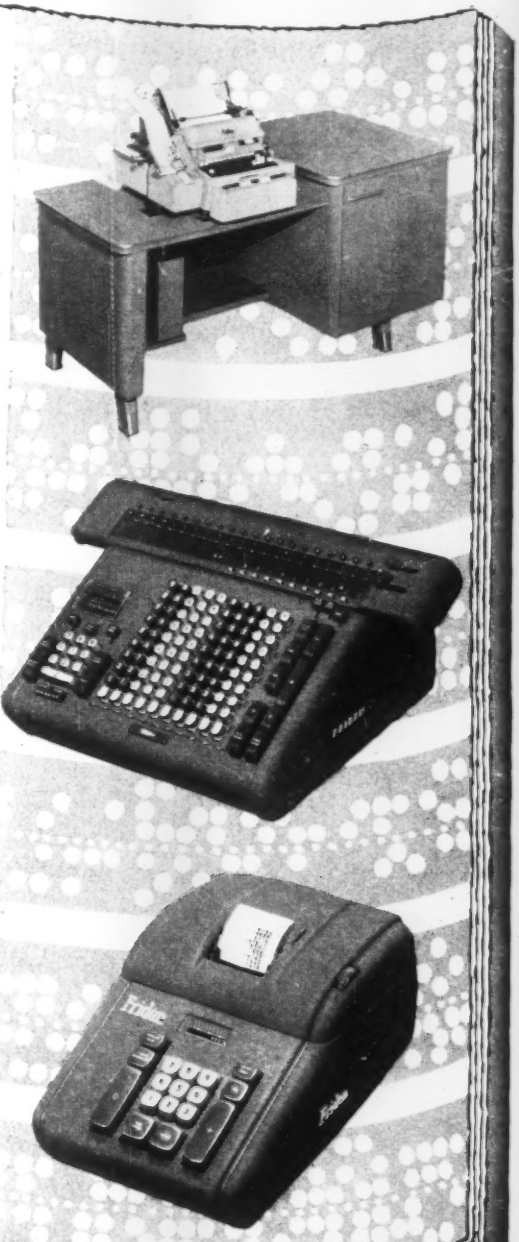
is an IDP machine combining automatic writing and automatic calculating. Equipped with automatic tape punch and reader, it interprets and records both alphabetical and numerical data. Produces tape enabling other machines to transfer data to punched cards or accounting records; or data may be sent by wire to other offices. The Friden Computyper is widely used to systemize billing, inventory, cost analysis, sales distribution, statistics, other typing-computing operations.

Friden fully automatic Calculator

is the essential programmer in many IDP systems. Operating alone or in combination with other automatic machines, this famed Calculator performs more steps in figure-work *without operator decisions* than any other calculating machine ever developed.

Friden Natural Way Adding Machine

has 10-key patented keyboard, Visible Check window for accuracy. Models are available with or without automatic step-over of multiplicand. Specialized adaptations of the Friden Adding Machine actuate or are actuated by IDP machines.



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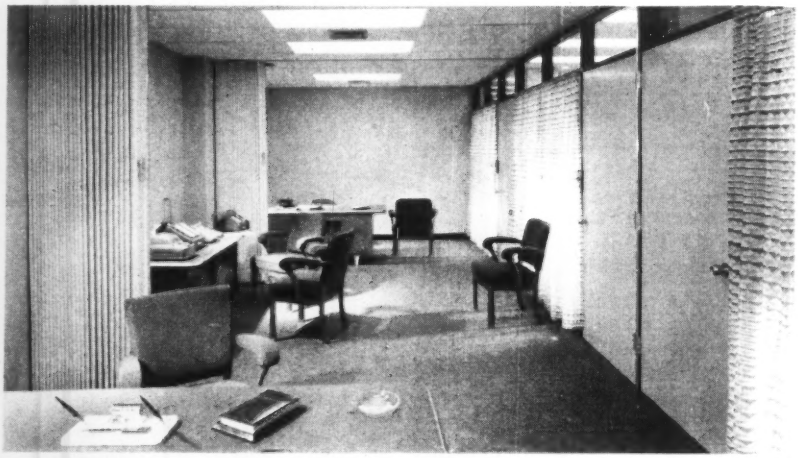


Michael Saphier and Associates, Inc.

USUALLY SEPARATED into two individual offices and a center work section, this area at the Monroe Calculating Machine Company sales demonstration office, New York, can double as a conference room when the accordion-type folding doors are pushed back.

GLOOMY BEFORE: Squint and squat were occupational hazards for filing clerks at *The Wall Street Journal* office before installation of new equipment. Lowest position on the office totem pole, filing is tedious and perhaps the most strenuous office job, is too often ignored.

BRIGHTER AFTER: The paper installed Diebold motorized files, turning filing clerks into machine operators. With the press of a button, tray files move up into reach, also raising worker productivity. These two units now contain all the records shown in the files above.

feature continued on page 89

Bernard F. Gimbel, Chairman of the Board, Gimbel Bros., as photographed by Peter Benech

"Nothing but nothing gets things done like telegrams," says Bernard Gimbel

"Nobody but nobody undersells Gimbels," says the Chairman of the Board of Gimbel Brothers. "For instance, we buy carpet by the carload—but only after we've checked enough other sources to make sure the price is as low as possible. Often we must move at a moment's notice. That's where telegrams can't be beat. Bids are placed fast and in writing—avoiding costly mistakes."

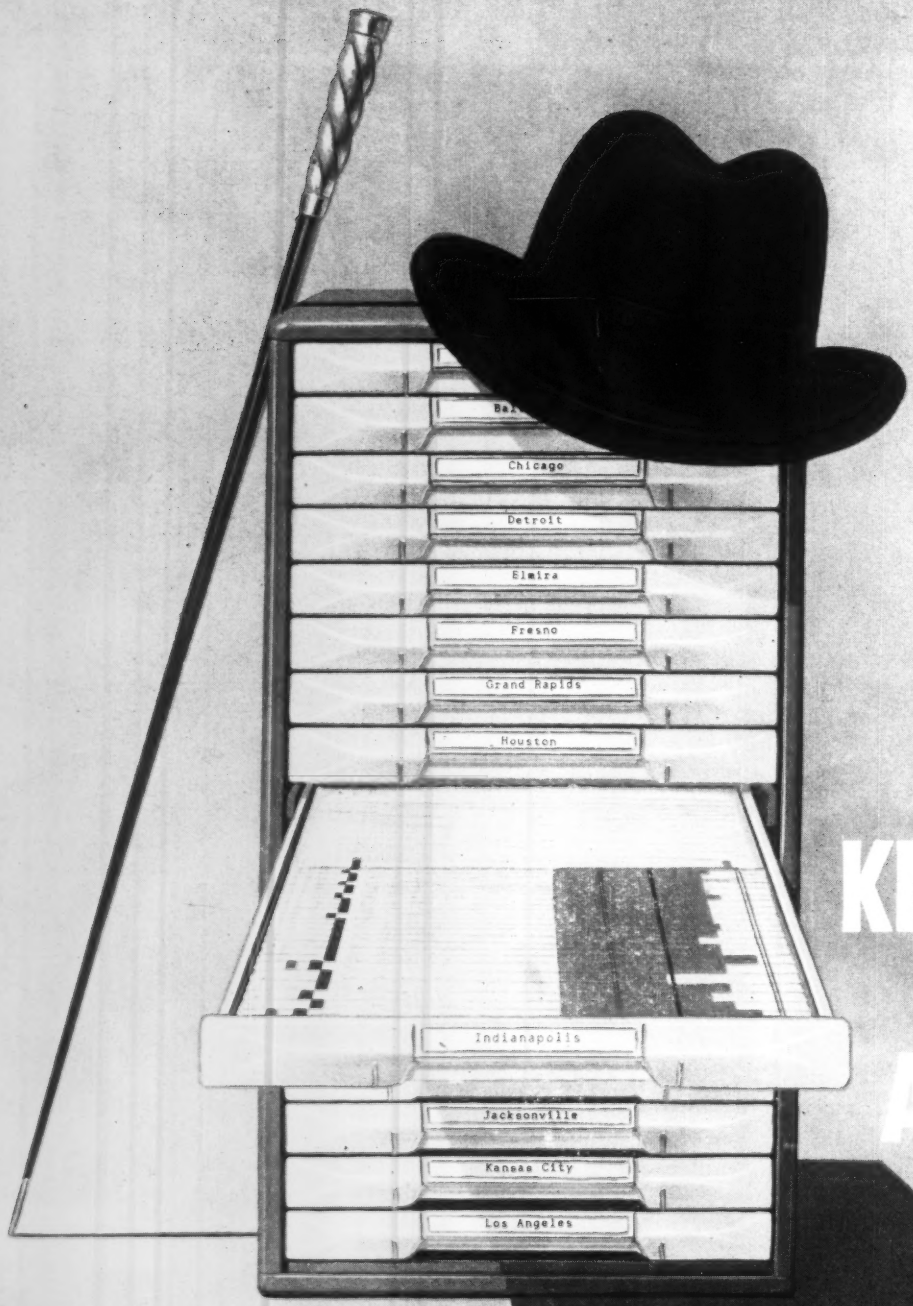
More than a million times a day, business finds it wise to wire. Telegrams quote prices, confirm orders, route shipments. Speed plus the written record make the telegram essential to American business.

DO YOU KNOW about these other Western Union services? *Market Surveys:* from a one-town check of dealers to nationwide sampling of consumer buying habits . . . *Charge it:* any time, any place, it's easy to charge a telegram.

WESTERN UNION
TELEGRAM

ON ANY OCCASION . . .

IT'S WISE TO WIRE!



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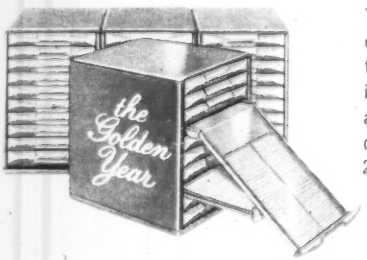


Tells all, too, with facts and figures at see level for the control of virtually every business performance or function—what to do about what—and when! The ultimate in visible recordkeeping, new **Kardex Aristocrat** is available in three striking 2-color combinations. Write for colorful and informative free booklet (KD829), Room 2064, 315 Fourth Avenue, New York 10, New York.

Remington Rand
DIVISION OF SPERRY RAND CORPORATION

HERE'S HOW THE FUTURE OFFICE WILL LOOK

A top request: typewriters that take dictation

DR&MI survey reveals what executives want in equipment they can't get now. And several architects and designers see the shape of the office to come.

LIKE EVERYONE ELSE, executives can dream. And the executives responsible for office efficiency in their companies dream of labor-saving machines that would enable them to handle quickly and economically the piles of paperwork that are steadily rising in most companies.

Many companies already are taking giant strides in upping clerical productivity—company after company reports that it is processing more paperwork now than a few years ago with same number of employees.

But office executives would like new and unusual equipment—some of it admittedly reminiscent of Rube Goldberg's creations—that is not now on the market. Our detailed survey of the offices in 376 companies reveals both satisfaction and dissatisfaction with present-day office equipment—the former outweighing the latter. About one company in three either asked for equipment not now available or complained about present-day equipment.

The most persistent plaint concerns prices. About 50 of the responding companies thought that equipment prices should be lower. There were also many who thought that manufacturers were not developing enough equipment for the small office. Others thought that present-day office equipment is too noisy, while a few felt that equipment breakdowns are excessive. Some felt that manufacturers should standardize sizes to allow for compatible interchange of equipment.

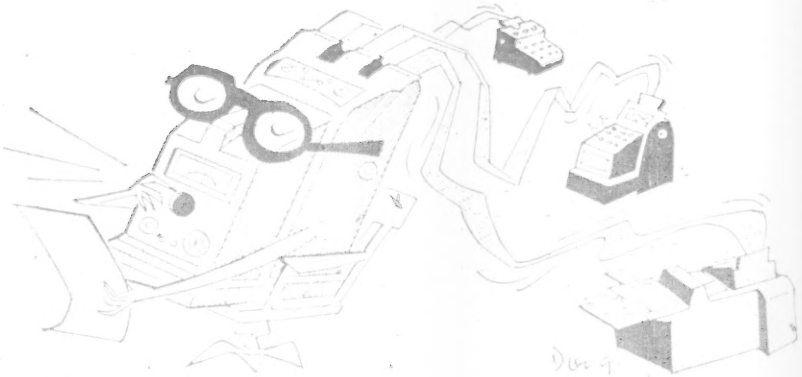
Here are some of the specific kinds of equipment companies would like:

- A dry-process office copying machine that would reproduce colors.
- A computer that would "read" printed copy and translate it to tapes to run various office machines. (An English company, Solartron Electronic Group, Ltd., has developed a pilot model of a machine that reads print and translates it for feeding into computers.)
- Moderately priced, small-scale punched-card equipment for the small office.
- A typewriter operated by the voice of the dictator.
- And (the most common request of all) a small-scale, low-price electronic computer for the small office.

But, oddly, about a dozen of the surveyed companies requested equipment—such as card-to-tape converters—that is already on the market. Perhaps there is greater need for missionary work on the part of manufacturers to prepare management for the office of the future.

next page, designers discuss design

Executives yearn for office machines that will go about their work as quietly as mice



Management dreams of an all-purpose computer able to read reports

REMOTE REPLY You can answer intercom calls from across the room—without touching a button!

COMPLETE PRIVACY No one can "listen in" without your knowledge. Chime and signal light announce *every* call.

...only Executone combines BOTH!

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• For the first time in *any* intercom system you can answer calls from across the room—and at the same time enjoy *positive* assurance that no one can eavesdrop on conversations in your office. Executone's exclusive "CHIME-MATIC"® signalling announces *every* call with chime and signal light—warns that your circuit is open.*

SAVE TIME—get more work done!

Thanks to Executone's "Remote Reply," employees can now answer calls without interrupting their work. You get *instant* response without loss of working time. You eliminate waiting and costly "call backs" when phones are busy. Roving employees are located quicker. You give instructions, get information without delay, yet you have "privacy protection" at all times. Work flows smoothly. Every hour becomes more productive! Executone soon pays for itself in many ways. Ask for full details. No obligation.

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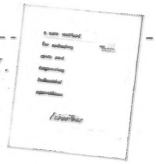


In Canada 331 Bartlett Ave., Toronto

Taking a look at the office of 1967 as experts visualize it . . .

What will the American office look like a decade from now? On pages 80 through 86 you've seen intimations of things to come, and on page 109 you'll learn how far automation has already penetrated the office. To round out the picture, DR&MI went to several architects and other experts in office design and layout and asked them to climb out on a limb to view the office of tomorrow. Here's what they see ahead:

. . . More information by TV

HARPER RICHARDS, *Harper Richards Associates, architects, Chicago*

The office of 1967 will have made greater changes in its use and conception than have taken place in the last ten years. These changes will be not only in appearance, but also in concept and workability.

The business machines people will supply us with a vast amount of labor-saving machines that will greatly influence the size and concept of the general office.

The period furniture as we know it today, which still dominates the executive office, will rarely be found. The executive office will be informal, rich in materials and art, simple in approach, having the feel of a living room, soft in lighting with varying degrees of intensity controlled by rheostats. The executive's monster of a desk will have disappeared, giving way to a small table. Most information will be received on a wall screen, either by television or projection. The view may be inwards on a central garden in the reception area. The keynote will be livability and practicality.

. . . Much more mechanization

WELTON BECKET, *Welton Becket and Associates, architects, Los Angeles*

Already ten times as much space is required for machine systems in the typical office building as was needed in similar structures only five years ago. Conceivably, the office building ten years from now could require so much electronic equipment that the architectural expression of these functional developments would literally be a ring of glass-sheathed offices surrounding a gigantic core of machines and de-

No More Stain or Smudge in Spirit Duplicating

It's true!

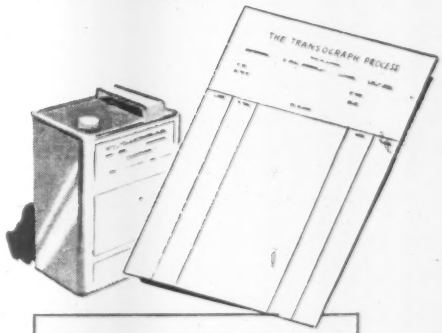
TRANSOGRAPH is a completely new duplicating process developed by Columbia for use on all existing liquid-type duplicating machines. It's not just cleaner—it's clean!

TRANSOGRAPH PROCESS can readily be integrated with present liquid processes—no special machines or adjustments—no extra machine parts—no special operating technique.

TRANSOGRAPH TRANSFER SETS are clean—non-sensitive to light. There are no printing restrictions—Kissprint—Impress print—Type—Write—Draw—Rule—Tabulate . . . file—rerun.

TRANSOGRAPH FLUID is non-corrosive—contains no oil to coat cylinder—produces brilliant copy.

TRANSOGRAPH COPY PAPER may be used on both sides—light-fast—water-fast—clean.



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Columbia TRANSOGRAPH

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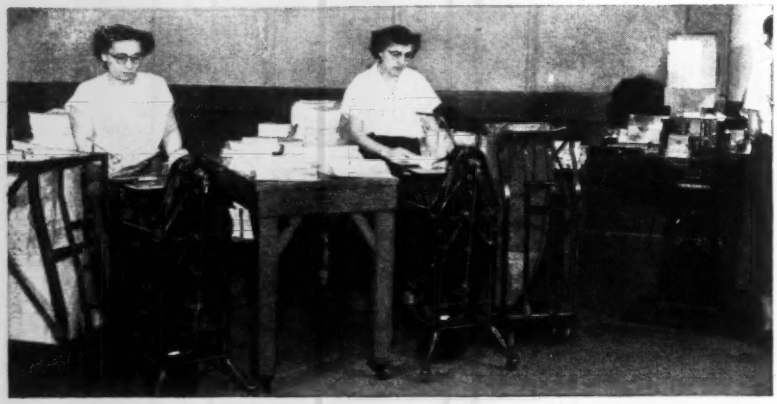

TIES 10 times faster for Butler Bros.

"We tie out as many as 100,000 pieces of mail a day on our Bunn Tying Machines . . . and do it 10 times faster than by hand-tying." This is the report of Miss K. Bryant, Service Department Supervisor of Butler Brothers, one of the world's large distributors of general merchandise.

Operators simply place a stack of envelopes on the Bunn Machine and step on a treadle . . . in only 1½ seconds it is neatly and securely tied, with a non-slip, pilfer-proof knot.

Dozens of different-type mailings go out each day, all at the same high speed—with no time lost for machine change-overs. Bunn Package Tying Machines adjust automatically to any size or shape. Whatever the size, every stack of mail is tied with just the right amount of twine and with uniform tightness.

Bunn Machines pay for themselves many times over, in many ways. Fatigue-less operation increases employee efficiency and production . . . anyone can operate without training . . . easily moved to break bottlenecks in any work area.

Tying mail is only one of hundreds of Bunn Machine applications. Thousands of companies of every type, large and small, use Bunn Tying Machines to tie such varied products as bakery goods, paper boxes, cans, meats, and many others. In fact, almost anything which can be tied by hand can be tied faster, better and more economically with a Bunn Package Tying Machine.

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vices to service them.

Perhaps the greatest single problem will be encountered in the environmental requirements for the ring of human beings that surround the core. For they are also changing and are rapidly becoming electrotechnicians and data analysts, instead of clerks and stenographers.

Of ever-increasing importance, therefore, will be the visual organization of space and the coordination of colors within that space to be conducive to both comfort and productivity. Sound- and sight-conditioning may well become as important as air conditioning has been during the past ten years, and the other standards of human comfort will rise beyond any existing criteria.

. . . Complete interior flexibility

KENNETH H. RIPNEN, *president, Kenneth H. Ripnen Co., architects, New York*

The office building differs from the school, home, hospital, hotel in that their room layouts remain fixed while the office layout is almost constantly being rearranged.

Ten years from now, functional, modular structures built specifically to house each individual firm and having complete interior flexibility will dot the skylines of the country.

. . . Intensive use of vertical space

MICHAEL SAPHIER, *board chairman, Michael Saphier Associates, Inc., interior designers, New York*

The future office will be both increasingly efficient and more comfortable to work in. There will be fewer private offices as departments become more integrated. In-building services for employees will be much more extensive. Economies will be achieved by centralized filing and duplicating equipment. There will be more intensive use of vertical space to offset high building costs.

. . . Like a production line

R. K. GAD, *director, Office Planning Div., Shaw-Walker Co., New York*

The office of the future will be time-engineered so that it will be more a machine for processing information efficiently and economically. Unlike the present situation, the future office layout will be planned as carefully as the production line. The entire staff will prefer that increased

LEADING COMPANIES EVERYWHERE ARE ADOPTING COPYFLEX ONE-WRITING METHOD!

Main office and factory of The Bristol Company, Waterbury, Conn.

Above: J. H. O'Connor, office manager of The Bristol Company, saves his company thousands of dollars annually with Copyflex one-writing system.

The Bristol Company Slashes Clerical Time and Cost 85% on Order-Invoice Operation!

The Socket Screw Division of The Bristol Company, manufacturers of the most complete line of socket screws on the market, has virtually eliminated all clerical work on its extensive order-invoice operation. Alert office manager J. H. O'Connor has done it with a revolutionary one-writing system made possible by Copyflex copying.

All items to be ordered by distributors from Bristol are preprinted on prepriced translucent forms. Distributors pencil in quantities desired and send originals of orders to Bristol. Copyflex copies, mechanically produced from the originals without further writing, serve as packing lists, shipping labels, order acknowledgements. Extensions are then made on the original order and additional Copyflex copies run off for use as invoices.

How Bristol has eliminated costly, time-consuming clerical copying and proofreading with Copyflex can be shown by Bristol's own Time Study:

	Conventional System (One-Order-Invoice)	Copyflex System (One-Order-Invoice)
Checking and Pricing Distributor Purchase Order	15 minutes	0 minutes
Preparation of Order Invoice	45 minutes	8 minutes
Totals	60 minutes	8 minutes

The savings made by Bristol can be projected to almost any paperwork operation in your business whether it's accounting, purchasing-receiving, or production control. Copyflex is the superior, modern copying process—clean, odorless, and economical. Letter-size Copyflex copies cost less than a penny each for materials. Copyflex will fit readily into your present systems. Mail coupon today! You'll be glad you did!

Copyflex Desk Top Model 110 copies originals 11" wide by any length, makes up to 300 letter-size copies per hour. Only $555. Other models available to copy originals up to 54" wide.

BRUNING *Offices in 38 Cities of the U.S. and Canada*

Copies anything typed, written, printed or drawn on ordinary translucent paper—in seconds. Copyflex

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productivity be reflected in higher earnings rather than in ornate offices.

. . . Acoustical domes coming

MAURICE MOGELSCU, *president, Designs for Business, Inc., interior designers, New York*

There will be a much more open, spacious type of planning with privacy and quiet no longer depending on surrounding walls. Instead of walls, it will be possible to throw a complete blanket of silence around any area by suspending acoustical domes above it. Or, wherever walls are desired for visual privacy, they will be of a new buoyant character —much lighter in weight, plugged together in sections on a split-second, snap-in principle, fitted up with permanent, concealed raceways for telephone and electrical lines.

There will be enormous advances in prefabricated products—partitions, floors, ceilings will all be speedily assembled or taken apart on an interlocking construction. Overnight an executive will be able to make unlimited changes, thus achieving real flexibility in the office.

. . . Electronic inventory control

J. GORDON CARR, *J. Gordon Carr & Associates, architects, New York*

All printed communications within a company will be sent through a single device — a photo-facsimile transceiver. All interested individuals or departments will receive copies simultaneously.

The TV-telephone will save executives many hours previously devoted to travel. They will be able to examine carefully intricate components and processes without actually visiting plants. Today's telephone conference call will be immensely more effective with the addition of TV.

An electronic control chart will enable the executive to tell at a glance the up-to-the-minute situation on critical items. It will be tied in with the data processing systems keeping a close tab on inventories.

Lighting will play a most important part in tomorrow's office, which will have lighted walls in many instances. Where employees cannot be placed near windows, interior areas will be planned to create patterns of luminosity and interest by means of color, light, plants, and furnishings. The over-all effect will be varied for the mood desired.

feature continued on page 96

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This **ONE** machine does **THREE** office jobs.

prepares **offset paper plates!**

cuts **mimeograph stencils**

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See the MAN from MONROE

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THE OFFICE CAN BE A COMEDY OF ERRORS

What mistakes do companies make in planning and laying out their new or remodeled offices? How can you avoid similar errors?

IF COMPANIES treated their production areas as they do their offices, most products would cost about three times as much as they do now. This is the considered opinion of a well-known space consultant—one of a new management breed whose job is to correct and prevent the mistakes companies make in the nerve center of the business—the office.

This expert also estimates that not one in 100,000 new office areas is planned in detail before the architect draws up the blueprints for the entire structure or area. Good prior planning can result in considerable savings, for in the new, complex office the mechanicals—ductwork for air-conditioning, wiring for electricity and phones and so on—can run as high as 50 per cent of the total cost. If the plans for these essentials can be jelled beforehand on the basis of the office layout for equipment placement, work stations, and so on, costly later alterations can be avoided.

For example, a company decided to use an area for the accounting department after floors were put down in a new office building. As a result, it was necessary to cut channels in the concrete, install underfloor ductwork to provide an electrical outlet at each desk, and then replace the concrete. The disruption to other, already functioning departments can be imagined, for the job was comparable in noisiness to the roar of street repairs brought indoors.

After another new building was completed, but before the company moved in, management decided that two departments on two adjacent floors would function better if connected by a special staircase. The company went ahead with the decision for, although an extra expense of $1,200 was involved, this didn't seem excessive for breaking through the floor, building the stairway, and redecorating. But what management hadn't bargained for were the unseen costs—$4,000 for electrical rewiring. All could have been avoided by detailed preplanning.

In another corporation a costly remodeling job was required for an entire floor because the offices for executives with many visitors were placed on the far side of the general work area. Not only did visitors encounter a labyrinth in searching for the company officials they wanted to see, but in addition the constant trooping of people through the general work areas cut considerably into clerical productivity.

Pushing the Product

Management sometimes makes promiscuous and unwarranted use of the company's products in decorating a new office. Pride in the product and an effort at product promotion are certainly understandable. But sometimes the over-use of a particular product or material can backfire.

For instance, in one set of offices a certain type of metal is used for every conceivable purpose—and the most glaring misuse is in the construction of the doors between sections. The metal doors are cumbersome and heavy and certainly don't reflect credit on the material they were made from.

This is just another example of the unsound approach to office planning—something that very few companies would countenance in their production areas.

But even the best-laid plans sometimes go astray. In a recently completed office building in a large eastern city, the planners fretted over every detail like a mother hen. However, after the corporation moved into its spanking new offices, middle management executives began to hear voices. Along the tiers of private offices, voices and other sounds leaked over the top of the floor-to-ceiling partitions. For the hung ceiling, which housed the latest in lighting, air-conditioning, and so on, did not stop the spread of sound in this case. So a costly remodeling job is under way.

A large Midwestern company recently spent almost a half-million dollars for a new office building, on which construction had actually begun when the company abandoned the project and decided to build an entirely different kind of building—one much more suited to its needs—in the suburbs.

Another company constructed a new office building in the suburbs and boosted the budget for it considerably to make it into a public relations showpiece on the outside for the thousands of cars passing on the nearby roadway. Only later did management learn that the cars rocketed by on the turnpike—not a mere roadway—at a speed that allowed no side glances at architecture.

Choosing the Place

Companies seldom approach the problem of moving their offices as systematically as they do plant location. For instance, the president of one large corporation decided that the company offices should be moved from downtown to midtown New York City. The move cost the company $2 million and the higher rental would add another $2 million to costs during the twenty-year lease.

There were no compelling reasons for the shift. The former space was in good condition and in no way hindered office operations. Why was the expensive move made? The president had moved his home from one suburb (where commuting to downtown is better) to another where commuting to midtown is better!

However profligate this office move seems, it doesn't compare with the casual way in which the president of one company bought a building to house his offices. On the spur of the moment, while with some drinking companions, he bought a $1.5 million office building that turned out to be completely unsuited to his company's needs. The resulting loss in unloading the building ran into hundreds of thousands of dollars.

In another company a mystery developed over the ownership of 21 four-drawer files. In taking stock of office equipment while preparing for a major revision in office layout, the space planners spotted the bank of files, which were standing midway between two departments.

When the space planners went to the head of the department on the left they were told that he did not own them, so obviously they must be used by the department on the right. But this department also denied ownership. The files had been under the noses of the two department heads for several years, each assuming they belonged to the other.

When the files were opened it was discovered that they contained old, virtually useless records that should not have been taking up valuable high-rental floor space.

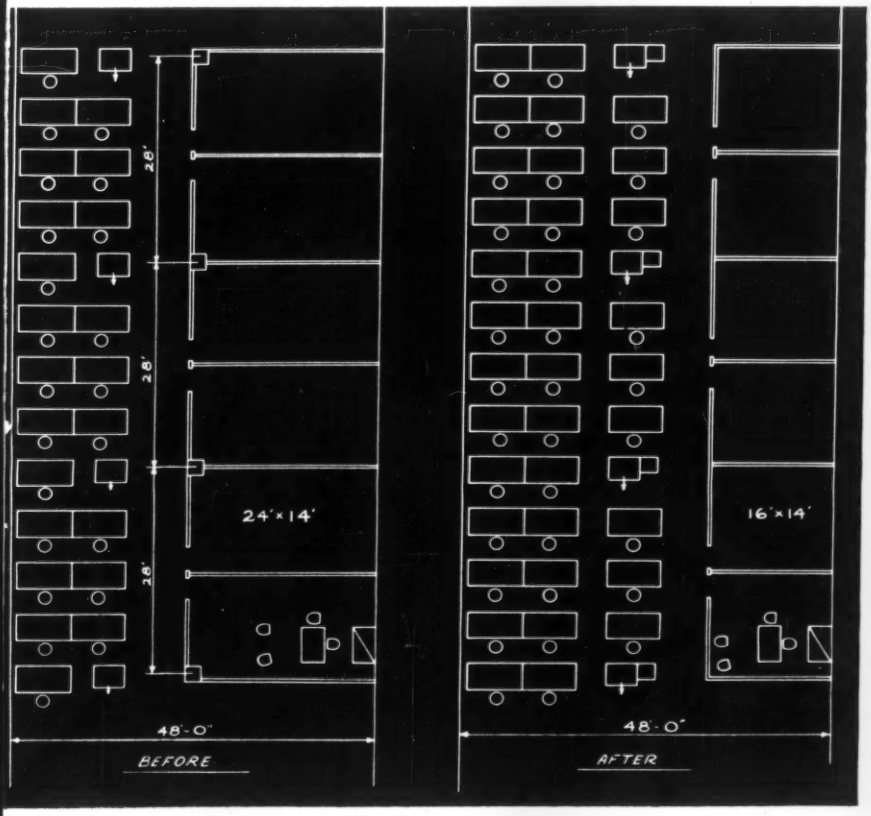
Let's Be Friends

In another company, management feels so compelled to get its full measure of value from the rented space that desks in general office areas extend—touching one another—from window to window. So cramped are the clerical workers that when one leaves or returns to his desk all others in the row rise like people in a movie theater. Recently, the company's management had its eyes opened by the fact that during vacation—with a sizable number away—clerical production was actually higher than at other times during the year.

Relationships between departments should largely govern their proximity. In one large chemical company the traffic department was placed within a section devoted to the development and production control of one particular product. This situation was a natural one, because in former years this one product had accounted for almost the entire production. But although the situation had changed drastically with diversification, the old set-up—both organizational and physical—had continued to exist, resulting in wasted steps and unnecessary snags for the other departments dealing with the traffic department.

By miscalculating its space requirements, one major company signed a lease for nearly 50 per cent more space than it actually needed. An expert on space planning showed the company that the space it had leased—but not yet moved into—was not suited for its purposes. By moving into a smaller area in the same building—easily arranged, for office space in the city was tight—the company was able to chalk up savings of $75,000 a year, or more than $1.5 million on a 21-year lease.

A similar amount was also saved



How to save $90,000

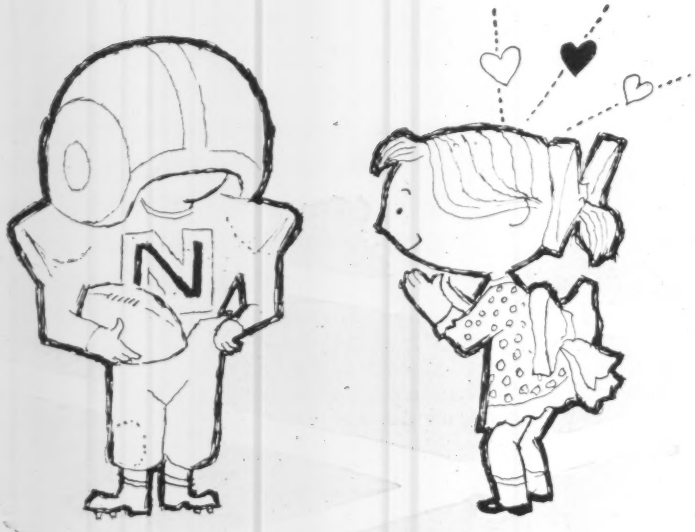
A small equipment maker in Pittsburgh was faced with this problem: he needed more space for an expected 20 per cent increase in engineering personnel. After studying and restudying the present layout (see "before" sketch) he could see no alternative to building an addition to the existing structure. After signing a construction contract and while preliminary work was being done, the company reconsidered and called in a space planner.

He quickly demonstrated that by shifting the aisle from the left of the supporting columns to the right and reducing the size of private offices (see "after" sketch), the present space could accommodate not only 20 per cent more engineering personnel but actually 50 per cent more.

The company gave the contractor a settlement of $10,000 on the entire $100,000 contract. Although the company had lost $10,000, management was consoled by the fact that the much greater loss was avoided and that it was now making much more efficient use of existing space.

neenah says:

some people
never see you . . .
only your
letters . . .



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by a Southern state in constructing its new State office building a few years ago. By centralizing several kinds of equipment, by substituting five-drawer for four-drawer files, and by improved layout, the space needs were considerably reduced so that the building was put up for $3.5 million rather than the projected figure of $5 million.

The leasing of space on the basis of square footage without considering the *shape* of the space is probably the most common single error companies commit.

An Eastern railroad recently moved its headquarters and signed a lease based on the square footage without analyzing the shape of the space. Costly alterations and hobbled operations were the penalty. For the shape of the space should conform to the shape of the office layout (based on workflow), not vice versa.

Guessing at Clerical Costs

The entire area of office costs is still largely unexplored in most companies. The top brass in most plants can tell you promptly and precisely what it costs to provide a production worker with a place to work. But comparable information for the clerical worker is virtually nonexistent.

Only 27 companies of the 376 surveyed by DR&MI were able to provide estimates, and about half of these were admittedly only considered guesses. The very variation in the estimates attests to their lack of precision: they ranged from $100 to $5,824. The median figure, for whatever it may be worth, was $600.

But why *does* the office lag behind the plant both in productivity and scientific management? For decades the office has been considered only the source of necessary overhead. Only very recently has management begun to look upon the office—as it does the plant—as the source of savings and additions to profits. If you manage to cut office costs only $10,000 in 1958, it will be the same as if you had added about $100,000 to sales—no easy task for the medium-sized company in today's markets.

Secondly, the office has been neglected, for few executives specializing in office management have reached the top rung in the corporate structure. Most top brass still come from sales and production, with a sprinkling from the legal and financial sides.

Consequently, there has been and continues to be a widespread lack of awareness of and sympathy with the specific objectives of professional office management. Those in charge of company office functions have not been upgraded sufficiently to get close to the ear of the top brass. Although the coming of the giant computer is bringing new attention to the office, top management is yet not thoroughly convinced of the pivotal importance of the office function to the entire operation. So the support that is needed to avoid makeshift operations and even serious errors is lacking.

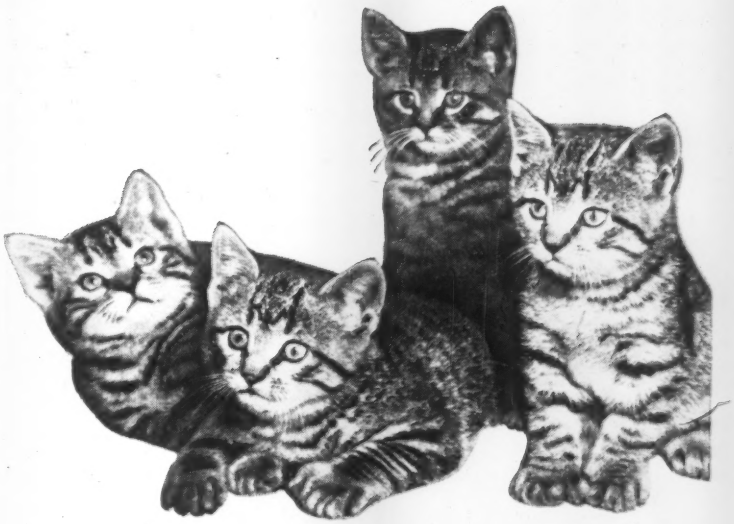
In most companies the responsibility for the information-processing services—which is really what the office is—doesn't rest with one person or one department. The head of each department and section considers himself an authority on the processing of the particular information that relates to his own operation. But in reality he may know much about content but little about the form of processing. Also, departmental lines are weakening and companies are becoming more integrated. And the data-processing problems and methods cut completely across departmental lines.

Steps for Planning

But despite the many mistakes companies make in setting up their offices, there is obviously a right approach. As outlined by R. K. Gad, director of the space planning division of the Shaw-Walker Company, proper planning involves these steps:

Stop thinking in terms of square feet for your new building or new rented area. And also avoid the common error of setting up rigid space allotments for each kind of clerical worker. A clerk in one department—sales analysis, for example—may require more files and calculating equipment than one in other departments. Instead, consider space utilization in terms of people and their particular functions.

Begin with the employee roster for each department. By personal interviews, find out what the people actually do on their jobs. What equipment have they been using and what equipment could make the job more efficient? What are their relations in workflow (paperwork) and traffic flow (movement of people) with their co-workers in the department,



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people in other company departments, and the public?

The office space planner generally accepts the workflow pattern as he finds it. He doesn't make a systematic probing of paperwork forms and procedures. Rather, he looks for the most efficient and economical way to process the present flow of information. In some instances, of course, wasted efforts and unnecessary procedures are easily spotted by the person making the survey of functions, department by department. In one large company, for instance, it was discovered that almost identical reports, that took up many clerical manhours, were being prepared in five different departments.

Saving While Moving

The pre-moving period is ideal for a thorough housecleaning of archaic methods and procedures. For by a judicious pruning, considerable savings can be achieved in space, equipment, and work stations needed.

Gad points out that in most skillfully planned moves, companies are able to reduce their equipment needs as much as 20 per cent. And the reduction in the number of files is even more impressive—up to 30 per cent.

And these reductions can be scored while clerical efficiency rises. How? By improving layout to conform to workflow, by combining functions, by centralizing equipment.

This modern approach to the functional office is in sharp contrast to the usual approach, which runs something like this:

Pressured by work snags in an old office area which is bursting at the seams, top management decides the time has come to put up a new building or rent space in a newly constructed office building. The first step is to measure the number of square feet used at the present time. Then two percentages are applied to the figure on total square feet. One is to add space to offset the present cramped quarters — "I guess we should have about 10 per cent more space" — and the other is to allow for future expansion of the company.

Too frequently, the percentage allowed for future expansion is arrived at simply by guessing at sales volume or total company employment five or ten years in the future. This frequently leads to waste, for in new or modernized quarters the same office functions could be performed in smaller

space. For it is not the total area that determines the usefulness of the space, but its shape as well.

After applying these two percentages to the present area, the top brass calls in an architect who will give—as one company president phrased it—"an aesthetic feeling to the mass." But more often than not mass becomes mess in terms of functional workflow.

Of course, there are a number of architects—Kenneth Ripnen, J. Gordon Carr, Welton Becket, and others—who advise the client that it is best for the architect to get into the act at the very beginning, and that detailed interior office layout plans should be developed long before any thought is given to the shape or size of the building or space under consideration.

Architect Carr believes that good office plans result from close teamwork between the space planner and company management—beginning at the earliest possible moment after the decision to move or remodel. The architect calls in specialists to analyze and recommend solutions for problems—such as data processing, record keeping, in-building feeding—because, says Carr, no one man can be expert in all phases of this highly complex field.

As the result of the backward approach to office planning, in some companies a year or two after the move clerical workers have more space than they can use, while in others they're uncomfortably and inefficiently cramped together. By using this method the president of a chemical company was at the point of contracting for a new office building with about 50 per cent more space than was actually needed. However, an interior designer demonstrated how the office operation should be housed.

When a company develops a production process for a new chemical, it starts and ends with the process in mind in building a plant. All factors—save the comfort, efficiency and safety of the workers—are secondary to the first goal—how to house this new process economically. If this sort of thinking were to govern management when it plans a new office building—and of course it has in some instances—clerical productivity (and hence company profits) would rise gratifyingly.

continued on page 102

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Checklist for Executives

How do you rate as an office planner? Do you make the same mistakes that hamper clerical efficiency in many companies? If you can answer "yes" to every one of the following 22 questions, then you certainly rank with the experts. However, if your reply to more than half of the queries is "no," you may be overlooking big opportunities for cost savings in your own office setup.

☐ In your present office layout do you consider flow of traffic as well as flow of paperwork?

☐ In planning a new or remodeled office layout, do you allow space for expansion within the next three years? Some new office buildings, completed within the past year or two, are already bursting at the seams.

☐ In setting up your own office building, do you insist on short-term leases with tenants in order to provide room for your own future expansion?

☐ Do you realize that it is frequently possible to improve lighting conditions considerably without investing in new fixtures? A change in decor can often do the trick.

☐ Do you avoid the mistake of placing desks face-to-face? When desks are so placed, productivity suffers with the rise in conversation and increased distraction.

☐ Do you make it a practice to review the layout of your offices periodically?

☐ Do you always keep clerical workers fully informed when planning layout changes, remodelling, or moving?

☐ Do you avoid the wasteful practice of allocating large offices to middle management personnel who seldom have visitors?

☐ Have you considered the space economies that can be achieved by allocating smaller offices to middle management and setting up a conference area that all can use to entertain visitors?

☐ When you make a change in office layout—such as placing two rows of desks together to save space—do you check the effect on clerical productivity? The results of cramped quarters and work proximity can more than offset savings in space.

☐ Are you aware of the error in thinking that the least possible space allocation per person represents

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good space utilization? Good planning cuts space where there is a surplus but also allocates more to work stations that justify it.

☐ Do you know that you shouldn't allocate more than about 15 per cent of your office space to aisles and corridors?

☐ Do you revise your office layout when workflow changes? Most companies analyze their layouts only when a new building is planned or an office is moved.

☐ Do you avoid allocating valuable window space to management people who spend most of their time out of the office? As a result, staff personnel doing important detail work may be placed in internal office areas.

☐ Do you consider floor-load capacity when planning to install computers, tabulating equipment, and other heavy equipment?

☐ In planning the size of a new office building to allow for expansion, do you rely merely on projections of the total number of employees at some future date? (It is better to break down the estimates into types of workers and functions that require different amounts of space.)

☐ Do you avoid space-wasting multiple aisles? Irregular aisles?

☐ Do you, where possible without disturbing existing operations, try to make office space do double duty?

☐ Do you place purchasing and other departments that have many visitors near reception areas to avoid traffic through general work areas?

☐ When constructing a new office building and projecting your possible expansion in the years ahead, do you decide on a target date when your company will be able to make another sizable capital expenditure? Expansion should be built in up to that date.

☐ If your company offices in one city are spread among several locations, have you made a detailed cost study to determine the possible economies in pulling them together?

☐ Are you fully aware of the error in assuming that mechanization *per se* means efficiency? Before mechanizing any office operation take a long critical look at it to determine:

- Is it really necessary?
- Can it be whittled down?

Unless you ask these and similar questions you may be only perpetuating unnecessary routines in a more efficient form.

feature continued on page 109

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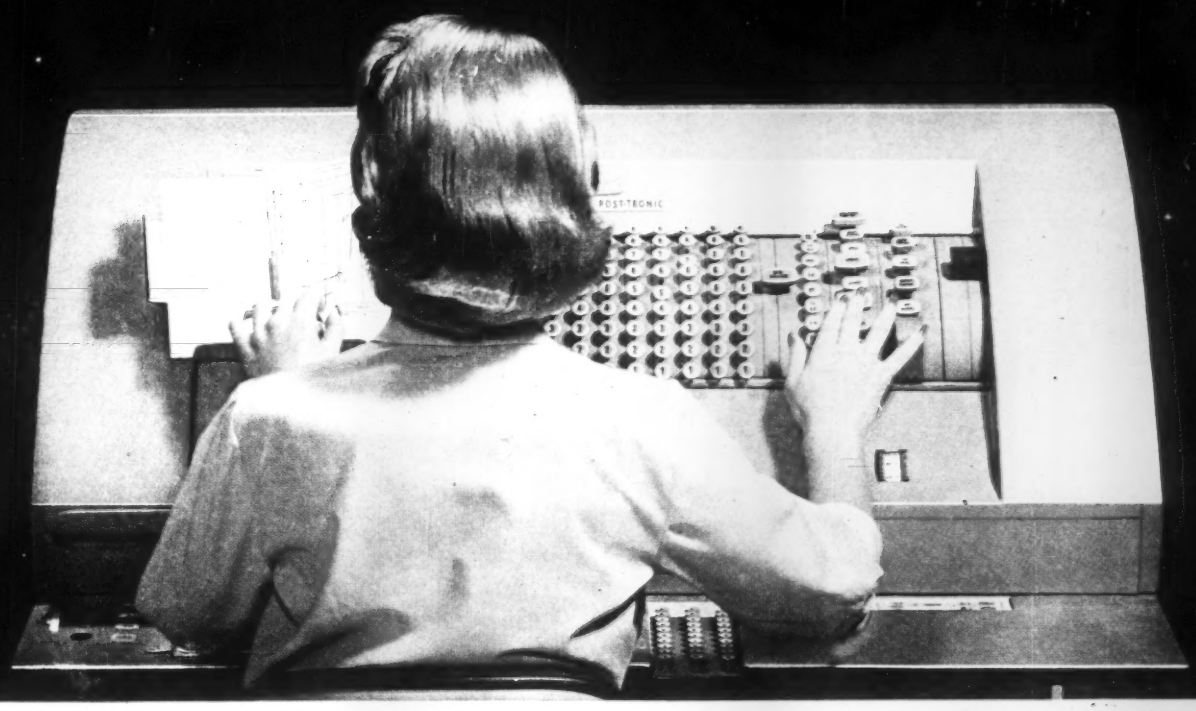

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Up to Now most of the operations in bank posting were subject to the human element, with countless possibilities of error and with time-consuming human effort.

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Through the miracle of *electronics*, far more of the work is done without any thought or act or effort by the operator than can be done by any previous method. And, therefore, *far faster*.

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WHERE OFFICE AUTOMATION STANDS

What are the facts behind the excitement caused by the coming of the computer? How many are actually in use today, and what are companies using them for?

ELECTRONIC computers are probably the most widely discussed management tool of this generation. Terms like "random access" and "feasibility study" are popping up with increasing frequency in management circles, and there is no shortage of literature designed to help the uninformed executive master the intricacies of this new and sometimes mysterious concept in information processing.

But outside the computer manufacturers' sales departments, few people have a realistic idea of how far the electronic revolution has actually progressed—how widely computers have actually been put to use in offices across the country. And, in companies where "follow-the-leaderism" influences management's thinking, wrong assumptions have led to some costly errors in decision.

Some companies, under the mistaken impression that hardly any computers are yet in actual use, have put off the purchase of a computer too long, while their competitors moved ahead. In other concerns, the notion that computers are popping up like mushrooms in offices all over the country has stampeded management into the purchase of electronic equipment which it wasn't prepared to put to economical use.

What are the facts about the computer situation at the present time? How many are installed in American offices? For what purposes, specifically, are they being used? How are they paying off in dollar savings or improved performance?

To answer these and other practical questions, DR&MI made a detailed nation-wide survey of 376 corporations—and found that almost 22 per cent (82 concerns) now have at least one general-purpose office digital computer in use. Another 21 per cent (78 companies) are planning to install one within three years.

Large companies predominate in the group that already has computers, while medium-sized firms make up the bulk of those intending to install them in the future.

A NEW NOSE-COUNT OF ELECTRONIC COMPUTERS

Here are the results of a survey of the major producers of general purpose digital computers. All but a very small number are installed in business and industry.

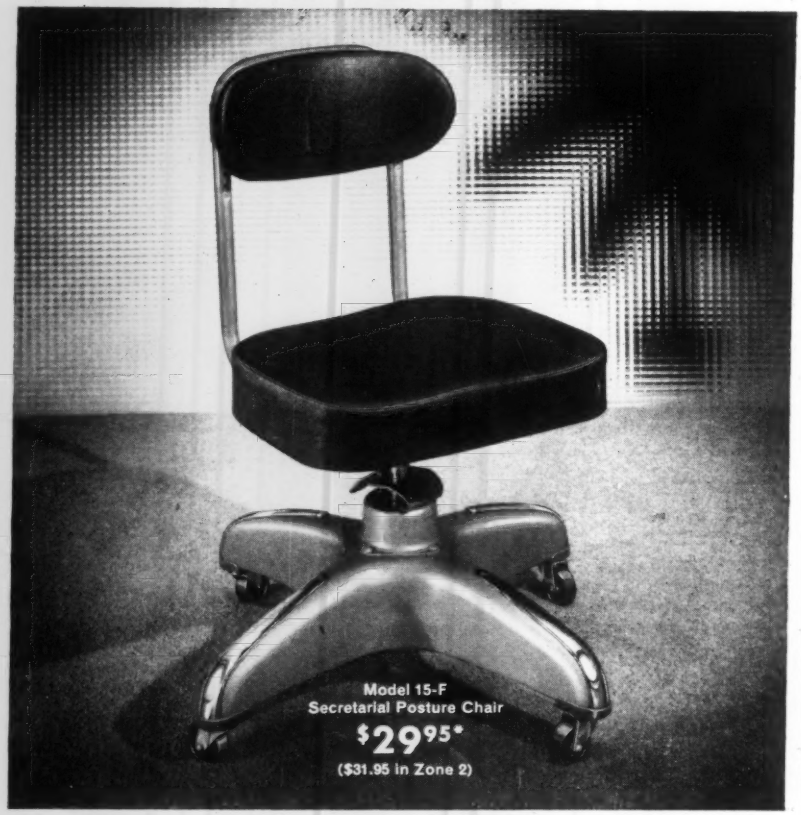
LARGE COMPUTERS	Number Delivered	Date of First Installation	Number on Order
IBM	125	1953	200‡
Remington Rand (Univac)	60	1951	50‡
RCA (Bizmac)	3	1956	2
Philco Corp. (Transac)	0	1957	2
Datamatic Corp.	0	1957	8
Total large computers	*188*		*262*
MEDIUM-SIZE COMPUTERS			
IBM	600	1954	1,200‡
Electrodata Div. of Burroughs Corp. (Datatron)	68	1954	70
Alwac Corp.	26	1954	29
Remington Rand	25	1956	150‡
Monroe Calculating Machine Co. (Monrobot)	12	1956	4
Underwood Corp. (Elecom)	12	1956	0*
J. B. Rea Company (Readix)	3	1956	1
Marchant Calculators Inc. (Miniac)	2	1953	0*
National Cash Register Company	0	1958	0
Total medium-size computers	*748*		*1,454*
SMALL COMPUTERS			
IBM	3,500	1948	1,500‡
Remington Rand	500	1954	100‡
Electrodata Div. of Burroughs Corp.	152	1955	30
Bendix Computer Corp.	55	1955	25
Royal McBee	49	1956	12
Underwood Corp. (Elecom)	0	1957	60
Total small computers	*4,256*		*1,727*
Total computers, all sizes	**5,192**		**3,443**

Large computers are generally those selling for $1 million or more; medium-size, from about $100,000 to about $1 million; and small computers, under $100,000.

* Model discontinued.

‡ Number on order is an estimate not supplied by the company.

How to hold your secretary!



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Model 20-LA
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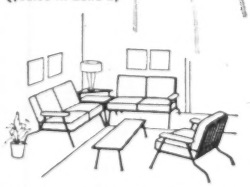

COSCO also offers comparable values in chairs, settees, sofas and occasional tables.
Zone 2: Texas and 11 western states

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Among the 32 companies surveyed in the fabricated metals products industry, interest in computers was rather sparse. Only one company has a computer, and only five expect to get one. This is in marked contrast to the situation in other lines: railroads, insurance, utilities, oil companies, and instrument makers.

Here's how the 82 surveyed companies with computers use them:

FUNCTION	No. of companies
Payroll	57
Inventory control	49
Billing	36
Sales forecasting	25

Only a few companies report that they are using their computers for non-routine functions, such as operations research analysis. It is from this area that perhaps the most sweeping changes in executive methods may come in the next decade. (See DR&MI, October 1956, page 87.)

Few Are Disappointed

What have been the results of using electronic computers? The bulk of those 82 companies—63, to be exact—find that the operating results to date have been about as they expected. Fifteen feel that the results have exceeded their expectations. Only four are disappointed. Significantly, almost all the satisfied users have had their computers for more than a year, while the disappointed ones have had theirs only a matter of months. For once the difficult programming period is passed, the new machines usually pay off in reduced labor costs and fresher, faster information for management.

The controller of a medium-sized food company says that his company has achieved "faster reports and a decrease of three clerical workers in spite of a 34 per cent increase in sales volume," during the year its small computer has been in use.

But perhaps the most spectacular results were achieved by a major railroad which reports savings of $250,000 annually, with greater speed, accuracy, and service, from the installation of two computers.

From these and similar achievements, the computer manufacturers are looking forward to substantial gains in volume by 1960. Several producers expect their own volume to increase five-fold by then, and the entire industry may top $5 billion.

feature continued on page 112

The same old

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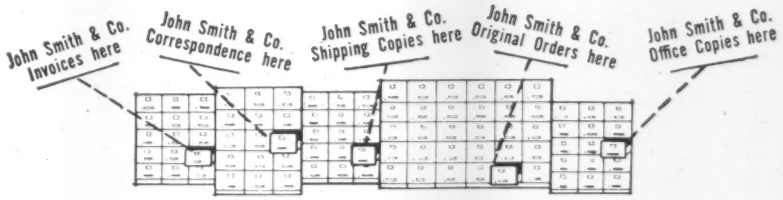
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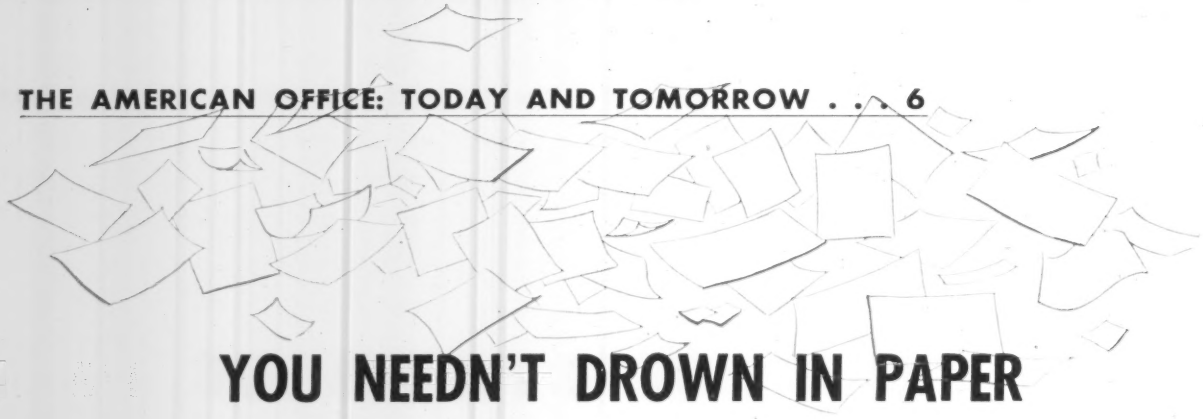


YOU NEEDN'T DROWN IN PAPER

ROBERT A. SHIFF
President, National Records Management Council

The flood of paperwork is rising each year. But companies can keep ahead of the tide by following these rules presented by an expert in paperwork control.

IN THE FACE of today's rapidly rising production costs and tight profit margins, it's a sorry business man who can't pin down his production costs to pennies and fractions. In too many instances, however, nonproduction expenses—especially in paperwork areas—are unknown. The cost of processing, say, a sales order or an accounts payable voucher remains a corporate mystery. For the most part, top management has been lax in taking action to pinpoint costs in an area of responsibility distinctly within its province—paperwork management. Yet measurement of such costs is obviously a prerequisite to controlling them effectively.

In company after company today, savings amounting to tens (sometimes hundreds) of thousands of dollars each year could be effected in a relatively short time simply by stemming the paperwork flood.

Is there a flood? Look at some of the indicators. In 1900, each American man, woman, and child accounted for the consumption of an average 60 pounds of paper a year. Today, paper consumption has skyrocketed to some 400 pounds a year per person—and forms, records, and correspondence accounting for a significant proportion of this total.

Take further proof: Today, there are over 8 million clerical workers in the United States, a 60 per cent increase since 1940. DR&MI recently reported that this clerical population is growing five times faster than our total population and accounts for some $70 billion a year in salaries alone. Despite this huge clerical manpower force and staggering expenditures to support it, many companies large and small claim they haven't enough clerical staff to cope with the rising paperwork tide. In fact, a serious shortage of clerical workers has been predicted by 1960. The shortage of stenographers and trained secretaries is already with us.

In 1946, in manufacturing industries alone, there were about five production workers to every one worker in a nonproduction slot. By last year the ratio had slipped to 3.6 to 1. This growing army of service personnel (now some 3.7 million strong in manufacturing) is creating more paperwork than ever before.

Contrary to popular belief, use of electronic machines in plant and offices does not reduce or eliminate the basic paperwork problem. Rather it accentuates the need for organized and integrated paperwork operations in order to achieve maximum effectiveness (not to mention accuracy). Otherwise, office automation will do nothing more than compound the paperwork headache.

With new high-speed printers turning out 1,000 lines per minute, and machines like the IBM 730 producing 120,000 characters per minute (six times faster than the printer in use with the 702), a new phenomenon—mass-produced records—is adding to the seriousness of the paperwork problem.

Moreover, it should be pointed out that the publicity given to electronic office machines has suggested to some that their use is more widespread than it actually is (see the article on p. 109). One informed estimate has it that the total market for giant computers in this country consists of only about 1,000 companies. What actually is happening is that many businesses are turning to outside service bureaus to supply their computer needs (especially for figuring payrolls, performing accounting operations, scheduling production, and so on) because their volume of paperwork doesn't warrant renting or buying these expensive devices.

Before going all out on some new electronic device to speed up paperwork handling, management should first obtain satisfactory answers to many questions. For example, will the proposed electronic device:

1. Reduce paperwork processing time?

2. Increase the company's capacity for handling paperwork without an increase in the workforce?

3. Perform functions that can't be performed now on existing office machines?

4. Reduce errors that aren't being controlled by existing checking procedures?

5. Lower unit costs for processing paperwork?

6. Process data from distant plants or offices that are received, say, on perforated tape by Teletype?

7. Fit into existing systems and procedures? Or will it require that all of them be changed immediately?

Only by taking this analytical approach to the application of electronics to paperwork operations can management expect to get positive results.

Paperwork Flood Wastes Dollars

What does the paperwork flood mean in dollars and cents to the company seeking desperately to cut costs? Studies by the National Records Management Council show, for example, that for every dollar spent to print office forms, more than $20 is spent for processing and filing them. Space and equipment costs for storing the contents of one standard file cabinet in the office exceed $50 a year. It is estimated that U.S. business spends some $12 billion a year to maintain records. This cost is figured on the basis of a cent a year to keep one piece of paper in files.

Filing equipment expenditures alone in one large corporation were clocked at an average $132,000 a year. After the management instituted a paperwork control program, that expenditure was cut to $28,000, a saving of $104,000.

These figures point up the magnitude of paperwork costs and the sizable savings that can accrue to cost-conscious managers who attack the problem at its core.

Recognize Symptoms Early

Most managements are willing to face the fact that they have paperwork problems only after their companies find themselves more or less pinned in a corner. Then management is forced to take corrective action. But by that time, untold profits will already have gone down the drain.

Can management learn to recognize the early symptoms of paperwork troubles ahead? The unequivocal answer is yes.

In any company, large or small, no

HOW FIVE PAPERWORK PROBLEMS WERE SOLVED

Paperwork control offers one of the most fertile ways of slicing non-production overhead and improving operation efficiencies up and down the corporate ladder. To prove this point, here are some typical programs and results:

Cutting Down Storage Costs

Company: E. I. du Pont de Nemours & Company, Inc. (Wilmington, Del.)

Problem: *Shortage of records storage space; increasing expenditures for records storage buildings and equipment. Four Du Pont buildings, used exclusively for paperwork storage, were filled to capacity, and company records were piling up at an ever-increasing rate. Management was faced with a new proposal to add 28,000 square feet of storage space at an estimated cost of $336,000.*

Results: Costly new space was not required. Space in all buildings was released for future expansion. Freed space in one building alone provided for five more years of expansion. Du Pont reviewed and updated its retention policies, reevaluated its storage requirements. By redesigning the storage layout to utilize steel shelving units and corrugated containers in place of transfer containers and wooden crates, the company effected a 132 per cent increase in space utilization, a 50 per cent reduction in records equipment costs, and generally improved reference service. A new indexing system and telephone communications throughout the records storage center permitted reference to any record within three minutes, and few records had to be taken from storage. After a complete physical inventory of all stored records was taken, shorter retention schedules were set; useless records were destroyed. Continuing controls were established to prevent recurrence of the paperwork flood. Speedy and well-controlled records reference service meant time savings and greater paperwork accuracy.

Improving Paperwork Quality

Company: A. B. Dick Company (Niles, Ill.)

Problem: *To improve paperwork accuracy and quality; reduce overhead costs by achieving sound paperwork control. The company's order and billing section, for example, practiced 100 per cent checking, which yielded far from 100 per cent quality and cost $10,000 a year.*

Results: By training one staff man in statistical quality control techniques, the company established a sampling plan to verify accuracy. The quality of work in a 20 per cent inspection sampling was used to verify or reject the quality of work in the entire batch. Control limits (figured as the number of errors allowed in the sample before additional review and checking were required) were set. So were procedures for corrective action if control limits were exceeded. Savings of $6,000 a year were effected by reducing labor for checking and inspection, and a 27 per cent reduction in error rate resulted. Job satisfaction was heightened because a good deal of tedious checking was eliminated.

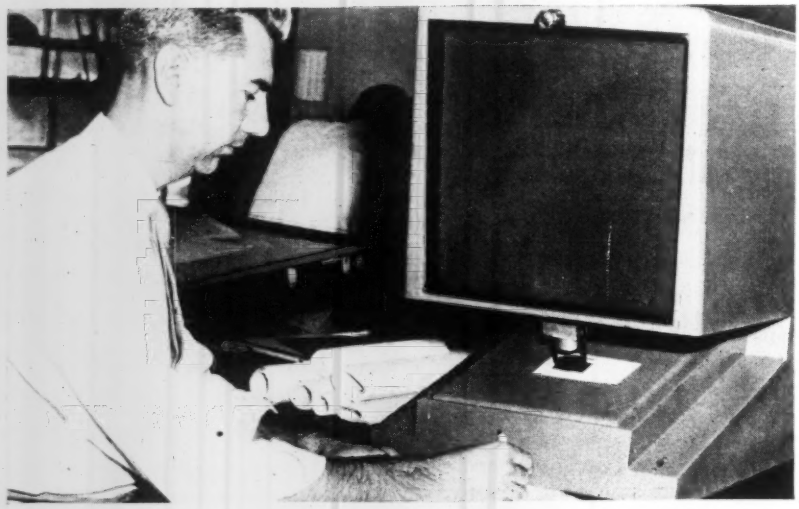
Pruning Microfilm Applications

Company: The Endicott-Johnson Corporation (Endicott, N.Y.)

Problem: *Microfilming costs were increasing. Storage space was tight, and filing equipment expenditures were steadily rising. Six types of records (earnings cards, cancelled stock certificates, pension applications, savings bond stubs, property department invoices, and income cards) were being microfilmed, supposedly for space-saving reasons.*

Results: Microfilming was used more judiciously to speed administrative processing of information and to eliminate manual copying operations rather than to save space. The company applied the test of weighing the cost of microfilming (some $20 per file drawer of records) against costs of storage in an up-to-date records center ($1.50 a year per file drawer of records). In this particular case, records could be stored for at least 13 years for the initial cost of microfilming. Use of low-cost storage in lieu of microfilm saved the company over $4,000 a year.

additional studies on page 118



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matter what products or services are offered, all paperwork operations can be conveniently divided into three broad areas—records creation, records processing, and records preservation or destruction. These three paperwork operations constitute the cradle-to-grave sequence of all records, reports, forms, correspondence, printed literature, and so on, generated in the business.

Eight Danger Signals

Within these three areas lack of paperwork controls can manifest itself in many ways. But here are some of the most obvious symptoms that management men must learn to recognize:

1. Shortages of records storage space and capacity in offices, plants, and records-storage areas. Steady purchase of costly new filing equipment.

2. Production backlogs. Time-consuming paperwork procedures that bog down production scheduling and product shipments. Duplication of forms in production operations. Uneven distribution of work loads among manufacturing personnel.

3. High incidence of errors in billings. Time lost in chasing down large and small errors.

4. Difficulty in finding data on production, research and development, sales, advertising expenditures, and performance. Lack of summary data that give top company officials the over-all profit-loss picture on individual product and plant performance.

5. Lack of age limits on filed material maintained in office and storage areas. Outdated and useless records occupying valuable space in active office, plant, and laboratory locations.

6. Unselective use of office machines (for microfilming, duplicating, and so on) with little or no regard for needs or costs. Lack of unit cost data on office machine usage.

7. Lack of company policy on vital records protection.

8. Shortages of trained personnel to set and maintain record-making and record-keeping standards.

Any of these symptoms, if allowed to go unchecked, will eventually spell a major paperwork problem for the company. If all the symptoms are present, it's a certainty that nonproduction costs are out of line, that top operating efficiencies throughout

the company are being sacrificed, and that company profits are taking a beating.

What's more, management is on more of a spot than it thinks. At stake may be not only lost profits, important though these are today, but the entire future well-being of the corporation. What would happen, say, in case of disaster in a company whose paperwork practices were inefficient? If vital records were destroyed because of lack of effective policy on the subject (Symptom 7), the chances are the company or one of its plants might be forced to discontinue operations virtually overnight. And vital records are important not only from the operational viewpoint. They act as a corporate memory that management can call upon for precedents, or for building a defense in certain litigations (anti-trust or patent suits, for example) or simply for writing company histories.

In contrast, what happens when company management takes the initiative in establishing a top-notch paperwork program? The eight symptoms disappear. Management gains control over the introduction of new and revised forms, reports, and correspondence throughout the company. Duplicate records and overlapping procedures are eliminated. Important forms and reports are simplified, standardized, combined. Data integration is simplified.

In the records processing area, management is assured that workable paperwork procedures are being followed. The effectiveness of

THE AUTHOR • Robert A. Shiff is president and former executive director of National Records Management Council, a non-profit advisory group established in 1947 with the aid of a grant from the Rockefeller Foundation to conduct research on the scientific control of paperwork. He has also been director of the U.S. Naval Records Management Center; district records management officer, Third Naval District; archivist and office methods specialist on the staff of the Secretary of the Navy; and a consultant to the New York City Mayor's Committee on Management Survey. In January of this year he became president of Naremco Services, Inc., a management consulting corporation organized as a wholly owned subsidiary of the National Records Management Council.

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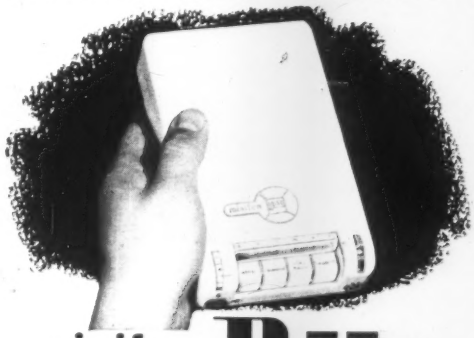

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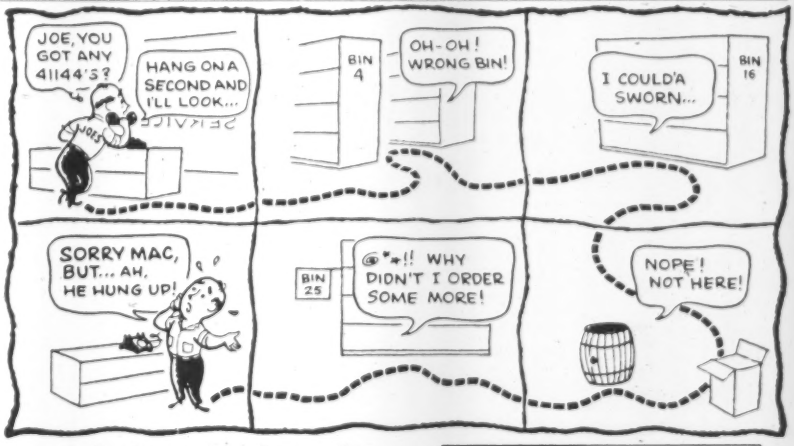
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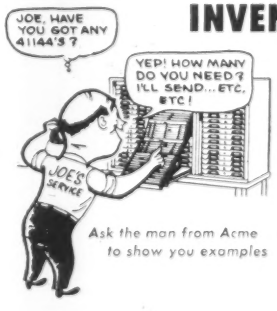

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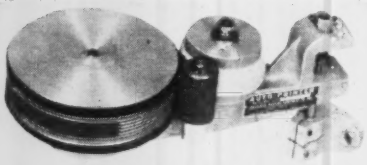

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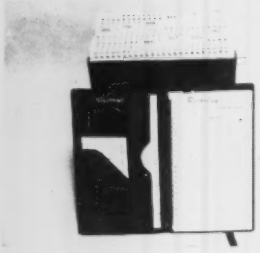

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microfilm and other business machines is evaluated from a cost and need standpoint. Files and records are given a standard classification pattern that speeds data integration and processing. Clerical errors in billing are reduced; production scheduling is freed from useless forms.

Records storage problems are minimized, more usually entirely eliminated. Records vital to company security and growth are identified and protected. Key documents are preserved for management memory and history.

Getting the Job Done

To attain this degree of control over all three paperwork areas, top management itself must first authorize an improvement program. An example will make the reason clear:

One organization was asked to approve a plan for consolidating six forms into one. Estimates showed that this move would save some $10,000 a year. But the plan was blocked by the department head involved, the final authority in this particular case. It was more than coincidence that he himself had designed the forms that would be made obsolete by the new plan. Personal pride dictated the decision. Such attitudes are all too human, but they can hardly serve as the basis for a rational approach to management's paperwork problems.

As far as the mechanics of getting the job done are concerned; a paperbound organization can tackle an improvement program in one of two ways. One way is for top management to give the go-ahead to a qualified staff member (secretary, controller, or office manager) to study the paperwork problem in detail in the company. Such a study must uncover such pertinent data as volume of records per employee in various company operations, space and equipment costs for records handling over a period of years, microfilming and other office machine costs on a unit basis, frequency of clerical errors, number of duplicated forms, and sources of paperwork backlogs.

More specifically, suppose, for example, company management finds that correspondence work loads are increasing steadily. After collecting and studying one extra copy of all correspondence over a test period (say two or three weeks), the analyst proposes correspondence shortcuts. With a view to standardizing and integrating correspondence throughout the firm, he might recommend, in some cases, that more and better form letters or pattern paragraphs be used to cut down on letter-writing time. Perhaps he may find that a paragraph checklist can be developed or that endorsement stamps may be used to standardize routine correspondence practices. Often he decides to work up standard instructions to all typists and stenographers, spelling out how routine and repetitive correspondence should be handled from then on. In so standardizing correspondence, reducing it to common practices throughout the company wherever possible, management benefits not only from improved

PAPERWORK CONTROL YARDSTICKS

Here are some key facts and figures reported by the National Records Management Council to use for measuring and costing paperwork practices.

The cost of maintaining 1 cubic foot of records in the average office (excluding personnel costs) is roughly $7.50 a year.

For each $1 spent on forms, $20 is spent creating, processing, and maintaining them.

One full letter-size file drawer holds 1.5 cubic feet of records. A full legal-size drawer holds 2 cubic feet of records. In a cubic foot of records there are about 2,000 pieces of paper.

Misfiles cost an average of $61.23 each.

There should be no more than 5 cubic feet of records per white collar worker, no more than 10 cubic feet of records per white collar worker in accounting and purchasing. A minimum ratio of total volume of records in storage to total storage area is 3.5 cubic feet per square foot of floor area.

A model records center with prompt reference service costs from 75 to 90 cents per cubic foot per year (including personnel, space, and equipment). A typical cost to maintain records in the office is $7.50 per cubic foot per year; for storage areas, about $3 per cubic foot per year.

The records in a particular series should be transferred to storage when the ratio of references per year to the number of file drawers is less than 12.

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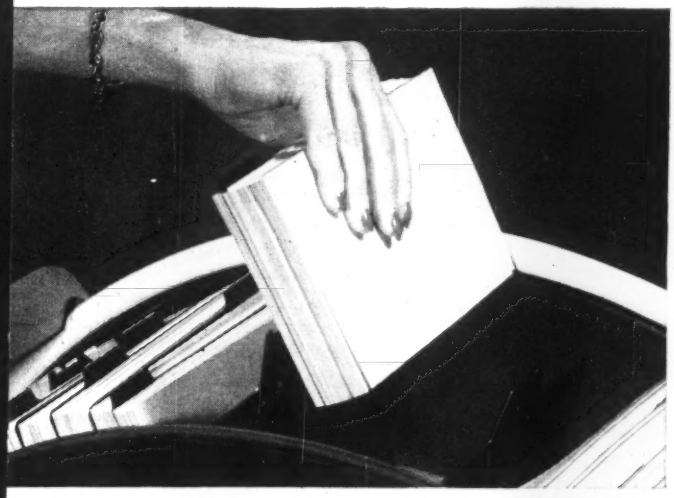

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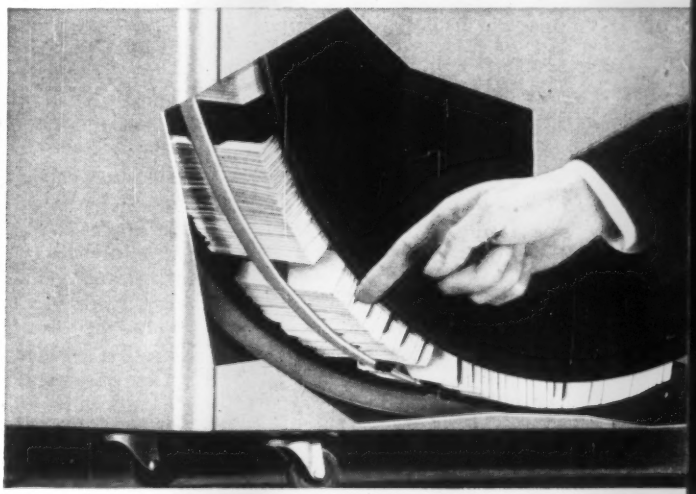

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letter-writing quality, but also from resulting reductions in dictation, typing, and reviewing times.

In the correspondence-laden office, an analyst sometimes finds that a simple expedient like using the backs of incoming letters for the carbon copies of the company's replies will considerably pare the volume of filed correspondence. Or the company may discontinue filing form letters; noting what form was used in reply on the back of each incoming letter will serve the same purpose.

Take another example of a paperwork bottleneck that a company analyst frequently uncovers. Wherever operating departments are using, ordering, or reordering multiple-copy forms (say, purchase order sets of ten copies, invoice sets of eight copies), he traces the distribution and use of each form in order to eliminate unnecessary handling and reduce to a minimum the number of copies actually required.

Where the information is being transcribed—for example, from a pur-

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CASE STUDIES *continued from page 113*

Reducing Records Retention

Company: Campbell Soup Company (Camden, N.J.)

Problem: *Shortage of records storage space; increasing nonproduction overhead. Filing cabinet purchases were increasing yearly; stored records were spilling over from three large areas. Valuable office space was being crowded with filing cabinets that housed obsolete and semiactive records. Operational, legal, and administrative requirements for handling paperwork were generally nonexistent or not readily available to line and staff personnel.*

Results: After more than 11,000 cubic feet of records were put through a physical inventory and evaluation, retention schedules for more than 40 departments were established. In setting retention schedules, these important tests were applied: How long must certain records be retained for legal reasons? How often are records in a particular series referred to? By whom? How long do other companies in the same industry keep comparable records? From the company's own experience, how important is each record series? On this basis, some 44 per cent of all company records—over 14 million pieces of paper weighing 73 tons—were destroyed because they were useless. Some 34 per cent of them were rehoused in an up-to-date low-cost records storage center. About 3,500 square feet of office and storage space were released at a saving of $17,700 a year. The newly installed records storage center doubled the company's available storage area.

Streamlining Paperwork Flow

Company: The Emporium (San Francisco).

Problem: *Reducing unnecessary backlogs, duplication and waste, and injudicious use of paperwork equipment.*

Results: Some 28 immediate causes of trouble were spotlighted, ranging from 72-hour delays in forwarding sales checks from suburban stores to the service building, to resale of merchandise to other customers because of failure to withdraw sold items from sales areas. The recommendations were: Consolidate inventory controls of various departments into one inventory control center. Schedule regular messengers and shuttle-truck service to handle paperwork. Use telephone service rather than paperwork to expedite rush deliveries. Establish an exception-control system. Decentralize credit actions, and let each suburban store handle its own.

By improving the flow of sales checks, a $4,500 a year saving was effected. Some 416 hours a year were gained in inventory control. About $8,312 and 156 hours a year were saved in the shipping department. Relieving supervisory personnel of the need to carry sales checks with them saved $1,200 a year. Countless customer complaints have been avoided by using telephone service to expedite rush deliveries. Decentralized credit handlings eliminated many telephone calls between suburban stores and the main office. The exception program reduced clerical errors.

chase requisition to a purchase order, then to a receiving report and a voucher—it is often possible to eliminate some copies and use others for more than one function. Or the analyst may introduce machine accounting processes or duplicating masters. In that way, all forms can be generated at one time and used to carry out each paperwork step without repetitive transcription and the consequent chance of error. In effect, this is a simple form of integrated data processing.

When customer complaints on slow deliveries of products run rampant, the company paperwork expert can decide to analyze paperwork procedures all along the line, from the receipt of sales orders through preparation of production orders and shipping notices to billing invoices. In order to level out peaks and valleys in billing operations, he may find it advisable to shift paperwork operations from end-of-month billing to cycle billing.

Where billing operations are concerned, a useful yardstick is worth keeping in mind: If billing costs for each customer exceed $2.50 per year, a company should look at billing operations with suspicion. High billing costs are a sure sign of excessively high overtime payrolls, uneven work distribution, generally bogged-down billing procedures. Out-of-line billing costs signal the need for work measurement and distribution analysis by the paperwork management appointee.

Stalking Errors

If a high frequency of significant errors is causing loud customer complaints, the company analyst will track down the cause of the errors. He does this by error analysis in each paperwork operation concerned. By distributing the number of prevalent errors over the people responsible for creating them, the analyst is tipped off to the type and source of errors cropping up. His analysis will probably show that personnel making recurring mistakes are insufficiently trained or need additional information (latest price changes, price extension tables, paperwork guides or manuals—even simple multiplication tables sometimes).

Where company management complains of having to prepare and read endless strings of reports, the company paperwork expert's approach is altogether different but no less analytical. After collecting samples of all reports (sales, production, and so on), separating them by function and analyzing them for repetitive data, data no longer required, and data of questionable value, he can suggest combining reports and modifying report procedures. He may well find that fewer reports are needed, that many reports are needed less often, or that exception-reporting can be substituted for regular reporting. Also, he can pinpoint costs.

How Long Improvement Takes

How long should a paperwork improvement program take? Company size is important in answering the question. So is the complexity and thoroughness of the job to be done.

In smaller companies—say, those with less than $1 million sales—it might take from three to nine months to get a program under way. In larger companies it might take from six to eighteen months to achieve the same results.

But results must be forthcoming quickly. Otherwise a program loses momentum. That's why it's important to begin the program in the areas where the greatest benefit can be achieved quickly and with minimum cost. Likely places are wherever repetitive paperwork operations occur—for example, order writing, receiving, billing, payroll, or wherever two or more paper workers perform similar tasks.

In getting an improvement program off the ground, special attention must also be paid to training personnel to carry on a continuing program. Paperwork improvement efforts should never be allowed to end. Large-scale benefits can accrue only to companies that put their programs on a continuing basis. Management men who think the job can be done on a one-shot basis are kidding only themselves. The savings they achieve will not be permanent.

The value of paperwork manuals and operating guides should not be underestimated. That's where instructions are spelled out to paper workers (especially trainees), identifying their duties in preparing forms, processing them, handling special situations. Manuals and guides are useful in reducing exception handling through standardized company paperwork procedures.

feature continued on page 120

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HOW TIGHT IS THE "WHITE COLLAR SHORTAGE"?

ALICE SMITH

As rising beginners' rates indicate, over-all supply is still falling short of demand—but impact varies widely. Here's what companies in different areas report.

AN ELECTRICAL equipment company in New Jersey would like to increase its clerical force by about 40 per cent, but it can't get enough qualified applicants to keep up with the turnover. A company in the same industry, located in Rochester, N.Y., has applicants waiting for any office jobs that develop.

A service concern in Chicago is likely to have 10 per cent of its office jobs open at any given time. A manufacturer in Minnesota has no problem; unsolicited applications take care of all office vacancies.

To get a realistic picture of the supply and demand situation in the white-collar field, DR&MI's editors queried more than 200 representative employers around the country on their recruitment problems. Replies indicated that the situation varies not only by state and by city, but among companies in the same city.

Is there an over-all shortage? About 45 per cent of the companies think there is, and that it has grown unusually tight in the last three years. Most of the rest say the situation is normal enough, or—as one personnel manager phrased it—that "there's no real shortage. We just don't get as many applicants as we used to." A very few seem to be encountering no problems at all.

New York employers, perhaps, are up against the greatest shortage of all. Of eighteen companies reporting, fourteen were having trouble.

In Chicago, only seven out of eighteen companies said they were experiencing unusual shortages, but many of the others were having some difficulty.

SPEAKING OF FRINGES: Besides bright, new office quarters, Connecticut General Life Insurance employees enjoy the use of a beauty parlor in the building—on company time.

In Los Angeles, five out of seven reported a heavy shortage, and one of the other two had some 40 jobs out of 850 vacant, but said that the supply had become looser recently.

In Philadelphia, three out of six companies thought the supply was very tight indeed, and one of the others was having trouble finding key punch operators. The three companies from Kansas City that replied to the questionnaire all reported a shortage; so did three out of five concerns in Minneapolis. In Detroit and Pittsburgh, the majority thought the supply adequate.

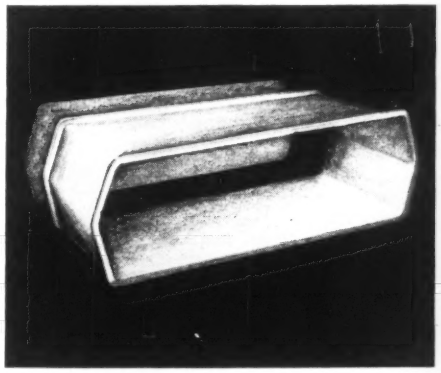
The situation in the smaller towns varied widely. Some companies said they received enough unsolicited applications to take care of all vacancies. Others reported that few of the girls in their areas were trained for office jobs.

Most of the personnel managers who are having trouble lay their difficulty to sociological causes: the low birth rate of the 1930's, early marriages, and more babies.

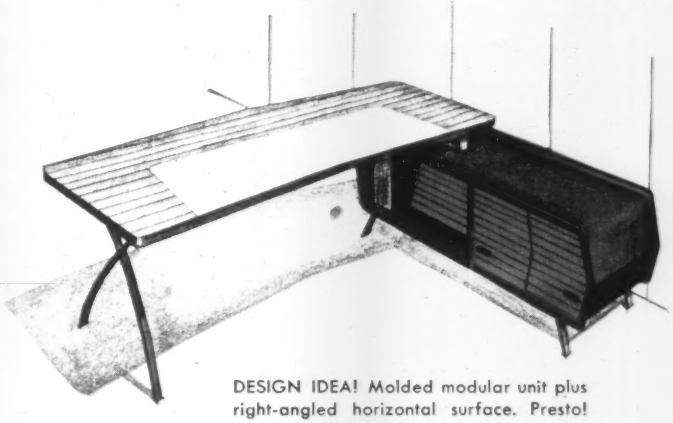
The trend toward college-going, a sizable group reported, also reduces the supply. "At the end of the college year," one personnel manager said, "we're simply swamped with applicants, but we don't have jobs for them because many of them can't type and most don't know any stenography. Furthermore, they're apt to want 'creative' work—writing ad-

IDEAS for profits from Monsanto's "House of The Future"

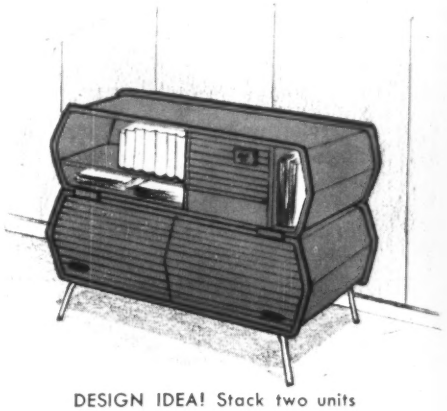
Modular office units of reinforced plastics



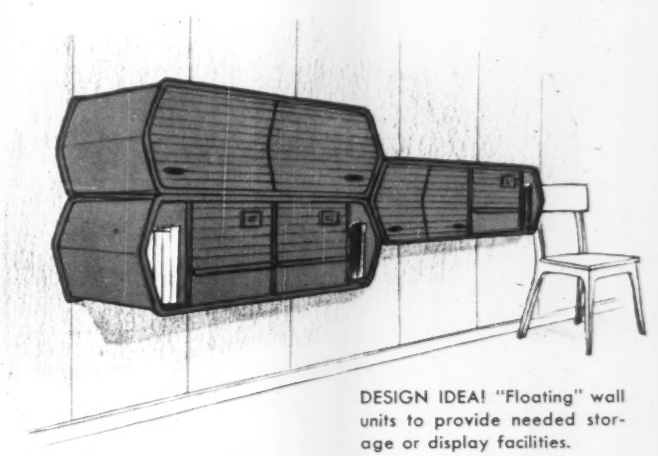
Plastic, modular office storage unit based on market research and design development work in collaboration with Richard Neagle Associates.



DESIGN IDEA! Molded modular unit plus right-angled horizontal surface. Presto! A striking, functional executive desk.



DESIGN IDEA! Stack two units (or three) for spacious bookcase-storage cabinet combination.



DESIGN IDEA! "Floating" wall units to provide needed storage or display facilities.

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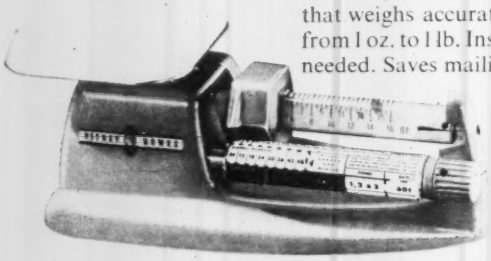

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vertising copy or something of that sort."

Some blame the schools for the lack of qualified candidates, and a few appear to believe that the young people of today are just naturally more irresponsible and less intelligent than those of a few years back. "Can't spell, can't lay out a letter," says the personnel manager of a company where only 2 per cent of the applicants meet minimum standards. "Poor vocabulary and insufficient knowledge of arithmetic," says another. Some complained that the majority of applicants had low I.Q.'s or a "passive attitude." One man summed it up this way: "People do not do a day's work—come in late—out for coffee—out for cigarettes—quit early and loaf on the job."

Little Choice

Whatever the cause, nearly all companies—whether or not they consider that there is a shortage—get very few qualified applicants for a job opening. Many consider themselves lucky to get even one who meets minimum standards.

In addition, some of those who do apply drop out during the rather elaborate hiring process that most of the larger companies seem to have adopted.

Curiously, there is not always a relationship between the precautions taken in hiring and the number who make good on the job. Among reasons for dismissal during the probationary period inability to do the work and lack of intelligence seem to be as frequent as any other causes—though absenteeism and tardiness are mentioned by a number of companies. Why girls quit after a week or two is not always clear.

"Just the other day," one personnel manager said, "we had a girl quit after a week on the job because she claimed the work 'made her nervous.' But she knew exactly what it consisted of before it started. In fact, she had applied for the job several times."

What are companies doing to attract more qualified applicants?

By far the most prevalent practice has been raising beginning salaries, and the raises quite naturally tend to be higher in areas where the supply is short. A California company, for example, has raised salaries for beginner secretaries $15 a week, now pays $87; stenographers are up $14

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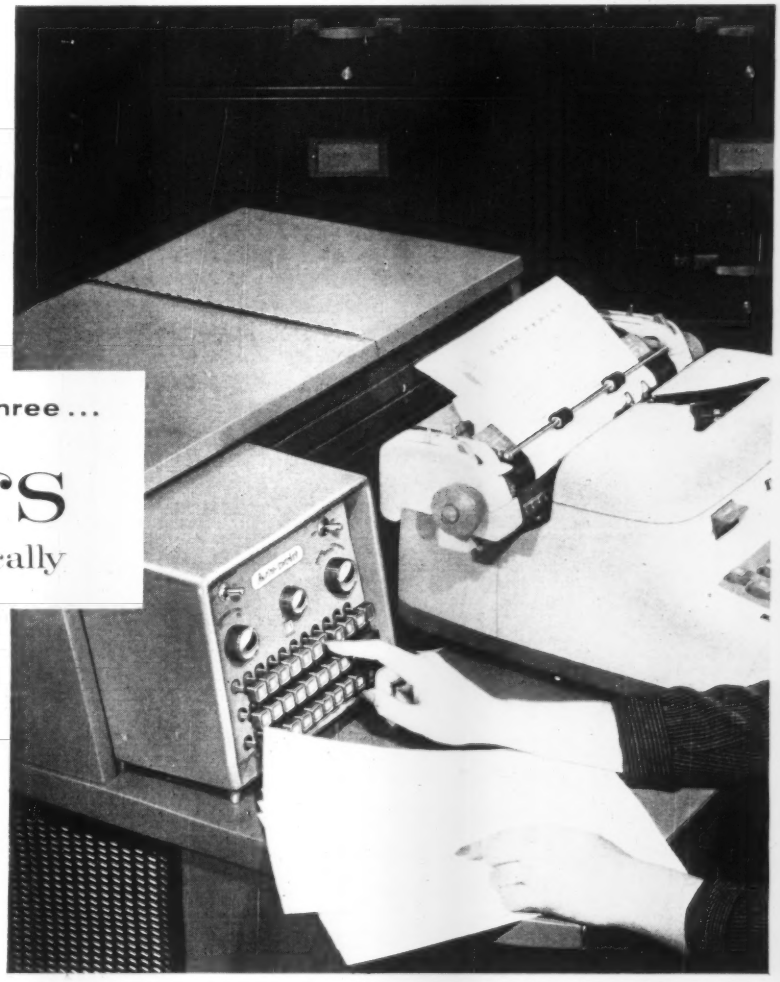

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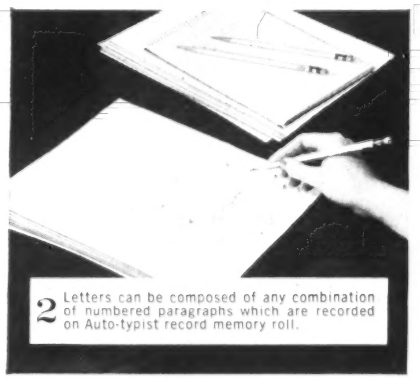

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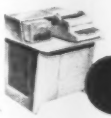

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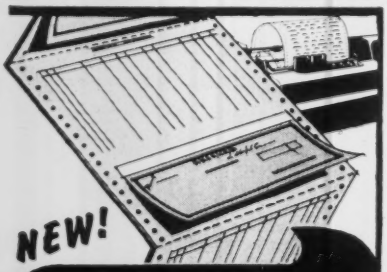

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to $79 a week; typists are up $8 to $72. In other areas, the raises are much smaller, and so are the actual salaries. It's a rare company that will pay more than $55 a week to a beginning typist.

Upping beginners' pay, of course, is likely to mean discontent among the more experienced unless it is accompanied by raises all along the line. Companies covered by the DR&MI survey seem to have made considerable effort to avoid difficulties of this kind. Most report that they have given blanket raises, although some say that the raises to the more experienced have not been large enough to maintain differentials intact.

Emphasis on recruitment of new high school graduates appears to be growing, and personnel departments are attempting to keep in close touch with educators. One large New York insurance company, in fact, has a high school "campus recruiter" who spends the greater part of her time visiting the schools. Seminars for business school teachers, "business education" days, luncheons for high school seniors, advertisements in school papers are among the means used to attract the graduate. Most productive, however, appear to be offers of part-time employment during the year.

Despite the various precautions taken by personnel departments, a good many high school graduates who are planning to work only until college opens do manage to find places on payrolls. This has helped to increase the shortage in the tight areas, since companies commonly "stockpile" graduates in June—hiring more than they need to make up for the attrition in the leaner months ahead.

Bounty: $75 a Head

Another source of applicants that seems to be receiving new emphasis is the employee referral. Few companies offer monetary rewards for this though most encourage it through bulletin board notices, stories in their magazines, or talks with employees. Where a monetary reward (range: $10 to $75) is offered, it is generally withheld wholly or partially until the new employee has been on the job several months.

Whether or not a reward is given, the employee referral seems to be a productive source of supply. For

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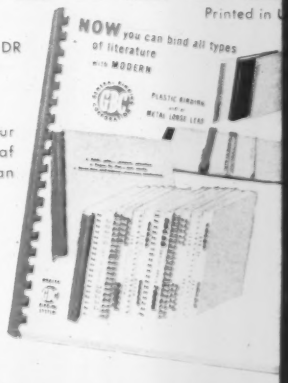

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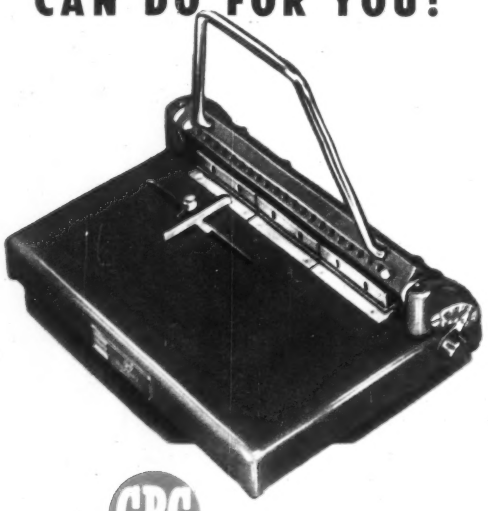

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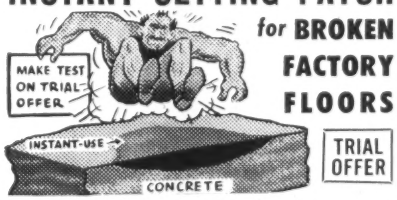

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more than 10 per cent of the companies covered in the survey, it is the main source, and a great many others find that it produces many of their applicants.

Companies have, however, about reached the bottom of the barrel so far as new sources of supply are concerned.

Only in the case of the receptionist job has an entirely new source come into prominence. In the New York area the practice of using retired policemen and firemen—executive-looking types equipped with old-world courtesy—appears to be growing. This, incidentally, is disappointing to many of the girl graduates. Personnel managers find that most of them start out with the idea of being receptionists rather than file clerks, typists, or stenographers.

What It Takes

Few companies admit that they have lowered standards for clerical jobs, at least within the last few years, and some say they have tightened up the requirements through the introduction of testing, or because they hope to be able to do more promoting from within.

A high school diploma is still, apparently, a prerequisite to most office jobs. So is a neat appearance and a "good personality."

Most conscious lowering of standards has been in the skills required. In some offices a girl who can type 30 words a minute is acceptable, and 80 words a minute is considered a passable stenographic speed, sometimes less than that if the girl can transcribe accurately.

As for age limits, the majority of companies have not changed them in the last few years, but there does appear to be a small movement toward the hiring of older women.

What constitutes "older," however, varies widely among companies. One concern, for example, reports that it has "raised the age limit to 30." Others mention 35, 45, 55, or even 60. A few have dropped upper age barriers altogether.

In addition, there is a group of companies that have simply become "more flexible" about all standards.

A Chicago personnel man says: "We have to take what we can get and then with patience try to develop them. About one out of four works out."

feature continued on page 126

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Stoller photograph

Symbolic of the efforts that many companies are making today to attract and keep white collar workers is this employee lounge of the Socony Mobil Oil Company's New York office. Providing 4,000 square feet of space as a center for employee activity, the lounge features colorful sofas and chairs, reading section, card and game area, and storage walls for equipment used in after-hours classes such as languages, handicrafts, and public speaking.

HOW FARES THE WHITE-COLLARITE?

HORACE E. SHELDON, *Director,*
Industrial Relations Department,
Commerce and Industry Association of New York, Inc.

While the office has been developing increasingly into a precision instrument for processing information, what has been happening to the pay and status of the white collar worker? Has he been losing much ground to his blue-collar counterpart? Is the white collar really becoming a noose, as some critics complain?

IN AN ARTICLE entitled "The Wilting White Collar" in one of its publications, the Economic Policy Committee of the AFL-CIO has told how the manual worker "with the help of unionism" has been narrowing or closing the gap between the factory employee and the office worker.

"The 'white collar' may still retain some of its value as a symbol of freedom from manual labor, but any tangible evidence demonstrating the superiority of white collar status has been fast disappearing," the AFL-CIO says.

The various unions trying to attract white collar workers have been singing the same refrain for quite a time. And the figures bear them out—up to a point.

Let's look at how office workers have fared over the years as compared with their brothers in the shop.

Long-Range Trends

Professor Robert K. Burns of the University of Chicago has developed the best figures available on salaried versus production worker pay trends since 1890. His earnings data for several representative categories of office and manual workers indicate that in 1890 salaried employees made almost twice as much as wage earners. In the next 25 years they further improved their relative position, while the number of clerical jobs in the country roughly quadrupled—growing at about twice the manual job rate.

During World War I the gap was partly closed as manual pay rates jumped ahead faster than office salaries. But in the '20's white collar workers regained much of their earlier margin, and they added to it when the more volatile factory rates fell more sharply during the early Depression years. Burns's data have them about 60 per cent ahead of the wage earners in 1933. From then on, factory pay began to catch up, and it took only the first few years of the

World War II production drive for it to pull even. By 1943 manual worker rates had moved ahead of salaried rates, and apparently they have at least maintained their relative position since then.

Many Factors

While labor spokesmen are prone to attribute the reversal of the old salary-wage relationship to the unionization of production workers, a number of other factors have been at work. Among them:

1. Years ago a much smaller proportion of the U.S. population had the educational qualifications for office work. Now the commonplace high school diploma opens office doors for a vast army of workers. This tends to depress the relative level of office pay.

2. The greater number of women in the work force, heavily represented as they are in white collar occupations, is another element in the supply and demand picture.

3. On the other side, the decline in immigration over the period, plus the reduced influx of rural workers, has cut the relative size of the manual worker pool.

The pay picture is complicated, naturally, by the changes in job composition that have characterized factory and office employment alike. The spread of mechanization with its dilution of skills has markedly affected compensation patterns. But since the "job mix" on either side will not stand still long enough for a good time exposure, any analysis of white collar versus manual pay trends can be viewed only in general terms.

The broad trend is unmistakable, though it may be difficult for the many white collar employers who are paying pretty fancy salaries to attract office workers to realize that clerical pay rates have lagged behind anything. But lest anyone get the impression from Professor Burns's long-range trend figures that the 1957 girl-in-the-American-office isn't doing very well, some other data will set him straight.

A look at the employment standards of office workers in New York City is instructive, since there are more white collar people employed there than in any other city in the country. The Commerce and Industry Association of New York has been surveying the rates of principal office jobs each October 1 since 1942. Its 1956 survey contains pay data on 60 clerical occupations in 491 companies for 85,000 employees. The jobs range from messengers or office boys at a median of $45 per week up to executive secretaries with median pay of $97. Rates on six key jobs have increased 2 to 6 per cent since last October.

Recent Comparisons

The Association has comparable salary data on 52 clerical jobs for the ten-year period October 1946 to October 1956. A comparison of the trend in the rates for these jobs with the trends in factory pay both in New York and throughout the country tells us how the New York office worker fared in relation to blue collar workers in the first postwar decade.

We see from Table I below that from 1946 to 1956 New York City office workers' pay:

- did not quite keep pace with factory workers' wages nationally. Production workers' weekly earnings went up 79 per cent to 68 per cent for New York office salaries.
- moved upward at a considerably steeper rate than factory pay in the same city, outclimbing the latter by 68 per cent to 43 per cent.

Weekly earnings trends, of course, are influenced by any material changes in the length of the workweek during the period studied. The Bureau of Labor Statistics reports

TABLE I
COMPARATIVE TRENDS OF NEW CLERICAL SALARIES, PRODUCTION WORKER EARNINGS, AND CONSUMER PRICE INDEX, 1946–1956

	Clerical Salaries New York City (2)		Production Worker Earnings, N.Y.C. (3)		Production Worker Earnings, U.S. (4)		BLS Consumer Price Index, N.Y.C.		BLS Consumer Price Index, U.S.	
Year (1)	Average weekly salary	% Change from previous year	Average weekly earnings	% Change from previous year	Average weekly earnings	% Change from previous year	CPI (6)	% Change from previous year	CPI (6)	% Change from previous year
1946	$39.33		$53.06(5)		$45.97		92.4		89.1	
1947	42.85	+8.9	56.91(5)	+7.3	51.72	+12.5	97.9	+6.0	98.3	+10.3
1948	45.48	+6.1	55.39(5)	—2.7	55.60	+ 7.5	104.0	+6.2	104.3	+ 6.1
1949	47.62	+4.7	58.83	+6.2	55.26	— 0.6	100.8	—3.1	101.5	— 2.7
1950	48.94	+2.8	60.63	+3.1	61.99	+12.2	104.2	+3.4	105.0	+ 3.5
1951	52.44	+7.2	61.38	+1.2	65.21	+ 5.2	110.6	+6.1	112.1	+ 6.8
1952	53.62	+2.3	65.88	+7.3	70.38	+ 7.9	112.4	+1.6	114.2	+ 1.9
1953	57.46	+7.2	68.11	+3.4	72.14	+ 2.5	113.3	+0.8	115.4	+ 1.1
1954	59.92	+4.3	68.96	+1.2	72.22	+ 0.1	112.6	—0.6	114.5	— 0.8
1955	62.65	+4.6	73.36	+6.4	78.50	+ 8.7	112.4	—0.2	114.9	+ 0.3
1956	66.10	+5.5	75.94	+3.5	82.21	+ 4.7	115.7	+2.9	117.7	+ 2.4
Increase 1946–1956	26.77	68.1	22.88	43.1	36.24	78.8	23.3	25.2	28.6	32.1

(1) Year as of October 1.
(2) Arithmetic average of median weekly salaries for 52 common office jobs. Based on Association's Annual Clerical Salary Survey for New York City employees.
(3) Average weekly earnings of production workers in manufacturing industries, New York City area. Figures from New York State Department of Commerce.
(4) Average weekly earnings of production workers in manufacturing industries, United States. Figures from Bureau of Labor Statistics, U. S. Department of Labor.
(5) Adjusted to reflect change in composition of survey in June 1949. The earnings averages for these years are not necessarily strictly comparable with those for 1949 and thereafter, but it is believed discrepancies in the data are inconsequential for our purposes.
(6) 1947–1949 = 100.

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show that the average workweek in manufacturing industries in the United States was virtually the same in October 1946 as in October 1956—40.5 and 40.7 hours respectively.

On the other hand, the Association survey shows there was a definite reduction in the average length of the workweek in New York offices in the same period. In 1946, 79 per cent of the employers reporting were on a five-day week. *Of these firms,* 37 per cent had a 35-hour workweek, 20 per cent were on a 40-hour basis, and the others were somewhere in between.

In 1956, only six of 485 reporting firms had a workweek longer than five days. Only 12 per cent were still on a 40-hour basis, and 55 per cent had a 35-hour week. While an exact measure is not available, it appears that the small lag in New York office salaries as compared with factory pay is accounted for or offset by the trend toward reduced hours in the office.

The Cost of Living

With the latest consumer's price index making the newspaper headlines each month, and particularly in view of the keen debate over the interrelationships between industrial wages and living costs, it is interesting to examine how office salaries have moved relative to the price index. As Table I shows, New York office worker pay during the ten-year period:

- increased two and one-half times more than living costs in New York.
- increased twice as much as consumer prices did nationally.

The Spread Between Jobs

One of the by-products of the common practice of granting flat dollar amount or "across-the-board" pay increases in the factory, especially in the case of unionized workers, has been the narrowing of differentials among jobs of varying skill.

The degree to which pay differentials have been maintained in New York offices is disclosed by a special analysis of the Association's survey data. The 52 jobs covered were ranked into quartiles according to the October 1, 1946 median salaries. Then the October 1, 1956 median rates for the same jobs were examined.

Here are the results:

	Average of Median Rates		
	1946	1956	Increase
1st Quartile	$31.08	$52.54	69%
2nd Quartile	35.77	61.38	72%
3rd Quartile	39.38	67.85	72%
4th Quartile	51.08	82.62	62%

Within the lower three quartiles there was no contraction at all in pay differentials; there was a very even average rate of advance throughout. And salaries for the jobs in the highest quartile, which pay markedly

TABLE II

AVERAGE WEEKLY SALARIES FOR FOUR CLASSIFICATIONS OF WOMEN OFFICE WORKERS IN SIX CITIES: 1947–48 AND 1956–57

City	Survey Dates	Typist, Class A	Stenographer, General	File Clerk, Class A	Bookkeeping Machine Operator, Class A
Boston	Jan. '48	$37.44	$37.31	$37.87	$42.88
	Sept. '56	55.50	58.50	57.50	61.00
	% Increase	48.2	56.8	51.8	42.3
Buffalo	Jan. '48	37.26	38.01	38.12	41.87
	Sept. '56	61.50	64.00	58.50	65.00
	% Increase	65.1	68.4	53.5	55.2
Atlanta	Dec. '47	36.66	39.42	36.34	43.54
	Apr. '57	56.00	61.00	56.00	62.00
	% Increase	52.8	54.7	54.1	42.4
Chicago	Feb. '48	43.70	44.95	41.82	52.15
	Apr. '57	67.50	70.00	66.00	77.00
	% Increase	54.5	55.7	57.8	47.7
Dallas	Feb. '48	38.10	40.72	40.13	45.49
	Oct. '56	56.50	64.00	56.00	63.50
	% Increase	48.3	57.2	39.5	39.6
San Francisco-Oakland	Feb. '48	46.60	48.13	45.59	51.63
	Jan. '57	66.00	71.00	68.50	76.00
	% Increase	41.6	47.5	50.3	47.2
Six Cities Combined	1947–48	39.96	41.42	39.98	46.26
	1956–57	60.50	64.75	60.42	67.42
	% Increase	51.4	56.3	51.1	45.7

Source: Bureau of Labor Statistics, U. S. Department of Labor.

more than those in the three lower brackets, increased only about 10 per cent less than the others.

There are some sharp differences in the rate of advance from job to job, however. For example, a senior duplicating machine operator's pay went up 109 per cent while senior accounting clerks realized only a 45 per cent gain.

The National Picture

There is no available single statistical series validly reflecting office salary levels throughout the country comparable to the Bureau of Labor Statistics earnings data for production workers in manufacturing industries. The BLS does periodically survey salaries for women in key clerical positions in a number of cities throughout the nation, but these cities are not surveyed during the same month of the year nor are the same cities always studied each year, and comparable data are available only as far back as the 1947–1948 period. Nonetheless, the figures in Table II for six representative cities show pretty well what happened.

THE AUTHOR • Horace E. Sheldon, now director of the industrial relations department of the Commerce and Industry Association of New York, Inc., has served as labor relations representative for the New York metropolitan milk industry, participating in labor negotiations involving more than 200 employers. He also has been a field agent for the National Labor Relations Board. Mr. Sheldon is a graduate of the College of Engineering of New York University and holds a master's degree from the New York State School of Industrial and Labor Relations at Cornell University.

For all four positions combined in the six cities, salaries increased 51 per cent over the nine-year period. By comparison, production worker weekly earnings rose 56 per cent from January 1948 to January 1957—from $52.86 to $82.41.

The over-all trend for these cities relative to factory pay nationally roughly parallels the New York office worker-U.S. factory worker comparison. While 1956 production worker hours were very nearly up to the 1946 level, there was a swing toward a shorter workweek in the offices, which, again, probably accounts for a great part if not all of the difference in the relative rates of advance.

Area Differentials

The inter-city differentials in clerical pay are pronounced, as Table II suggests. According to BLS figures for 17 cities in the Winter of 1955–56, the last survey period for which these comparisons have been published, Providence, R.I., business executives were paying their secretaries an average $61.50, and those in Memphis, $62.50, while companies in Detroit, Los Angeles, and San Francisco paid $81, $79.50, and $79 respectively, on the average.

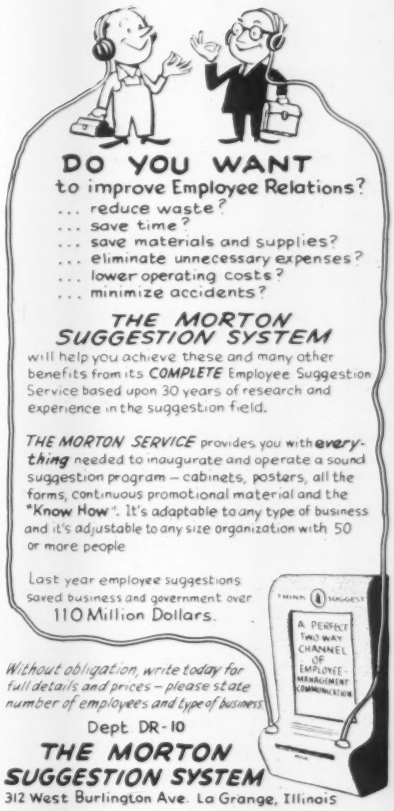
Intra-office differentials among clerical positions vary substantially from one area to another, too. Typically, general stenographers' salaries were about $11.50 higher than those of class B copy typists, while secretaries were paid about $12.00 more than stenographers. But the difference between secretaries' and stenographers' salaries ranged from as little as $8.50 in Memphis to $16 in Milwaukee. Secretaries' salary margin over class B file clerks was lowest in Providence, where it was $19, and highest in Detroit—$32.50.

A good over-all picture of relative office pay levels around the country is given by the following indices the Bureau of Labor Statistics has prepared using its salary data for 18 office jobs held by both men and women in 17 cities during the winter of 1955–56:

Northeast	
Newark—Jersey City	98
New York City	100
Philadelphia	89
Providence	84
South	
Atlanta	91
Dallas	90
Memphis	85
New Orleans	81
Middle West	
Chicago	104
Detroit	106
Milwaukee	94
Minneapolis—St. Paul	90
St. Louis	94
Far West	
Denver	91
Los Angeles—Long Beach	106
Portland	99
San Francisco—Oakland	104

White Collar Benefits

Moreover, the white collar worker by no means has lost all vestiges of special status. Not only does he still have a shorter workweek; he's still ahead of the plant worker on holi-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days with pay. Nearly two-thirds of the office employees get at least seven paid holidays. Only about 40 per cent of the factory employees get as many.

It's the same with vacations. In manufacturing establishments, 85 per cent of the office personnel are entitled to two weeks after only one year of work, or less. In the plant, only 19 per cent get two weeks after one year.

When it comes to employee "welfare" benefits, the picture is more mixed. Hospitalization insurance covers somewhat more plant workers (85 per cent) than office employees (78 per cent). Nearly all these plans also provide surgical coverage.

Over 90 per cent of both office and factory employees studied by the BLS have some group life insurance.

More than half of the office workers studied are entitled to sick leave at full pay without a waiting period, compared with only 15 per cent of the plant employees. On the other hand, sickness and accident insurance is more frequently provided for factory workers.

As to pensions, on the average about three-fourths of office workers are covered by company retirement plans. The coverage ranges from 50 per cent in New Orleans to 80 per cent in the Newark-Jersey City area and in Atlanta. About 60 per cent of the plant workers in the same 17 cities have pension coverage.

Financing the Fringes

The Commerce and Industry Association survey covering nearly 500 New York City office employers also goes into the question of retirement and insurance benefits and provides information on financing methods. Three-fourths of the New York pension programs are funded entirely by the company, and in the remaining fourth the cost is shared. As for hospitalization, surgical, and medical insurance, 49 per cent of the New York programs are paid for entirely by the employer, in 22 per cent the cost is borne entirely by the employees, and in the rest the cost is split. Fifty-three per cent of office group life insurance plans are financed solely by the company and in virtually all the others the employer pays part of the premiums.

The annual survey rounds out the picture on some other key office personnel practices, the much discussed

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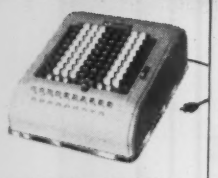

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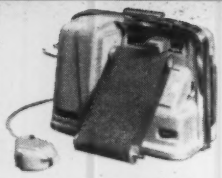

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coffee break issue, for one. Fifty-four per cent of 455 reporting firms in the 1956 survey said they had a coffee hour "plan" of some kind.

The Association also found that 38 per cent of the firms have formal rest periods. Fifteen minutes in both the morning and afternoon is the most common arrangement.

Indicative of employers' widespread adoption of "scientific management" techniques in office and plant alike is the fact that more than one-third of the New York companies said they have formal merit or performance rating plans for their office personnel. Significantly, 38 per cent reported they contribute to the cost of their employees' off-the-job education. Four-fifths of these concerns help pay for courses directly related to the job, two-thirds contribute toward the cost of general business courses, but only 7 per cent (of the 38 per cent) help foot the bill for schooling in unrelated subjects. More than 40 per cent of the companies with such programs pay *the entire cost* of the outside training.

Over-all Gains Substantial

What all this recitation of statistics adds up to is that although the factory worker has been doing some impressive "catching up," office employees are far from the underprivileged poor relations of the man in the shop.

On the pay front, the uneven effects of new work methods in both the plant and the office and the difficulty of relating the intrinsic worth of jobs in the office to jobs in the plant seriously detracts from the meaning of comparisons. Over-all, however, what stands out is that since the end of the second World War office workers' pay has pretty much kept pace with the earnings of the much more highly unionized segments of the economy.

Quite clearly, salaries have been pushed up in many areas by the competition of employers for scarce clerical help. But, apart from this factor or the influence of possible union inroads in the office, there is a lot of evidence that white collar employers have become increasingly alert to the need *and the fairness* of practicing the same sound employee relations principles to which so much attention has been devoted in the plant. All in all, office workers can expect to get a fair shake in the years ahead. END

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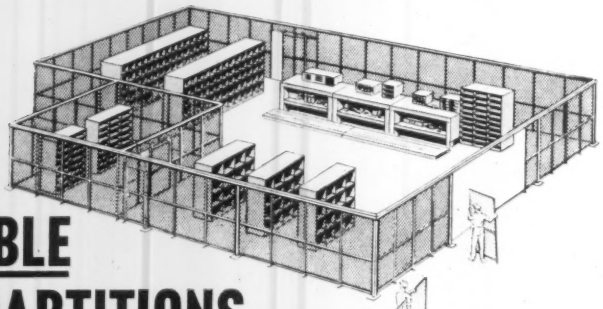
New low-cost way to set up a department
. . . enclose areas . . . change plant layout



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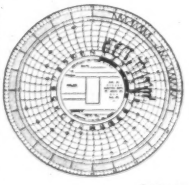

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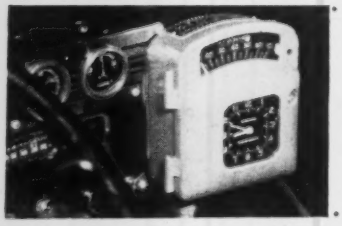

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INFRARED: LATEST PRODIGY

continued from page 58

ing used. Each manufacturer thinks his application is unique.

"Hot-Box" and Other Detectors

Infrared detectors can also usefully detect the presence of heat without making a fine temperature measurement. The most spectacular example is Servo Corporation's "hot-box" detector.

Hot boxes are the bane of railroads, causing innumerable delays and many wrecks. When there isn't enough grease in the journal box, the box overheats. If it gets hot enough, the axle will shear off.

A hot-box detector is mounted in a container on each side of a track. When a train passes over, little windows covering the two IR detectors pop open. A signalman in a nearby tower can read a chart coming out of a recorder, see which journal on which car is overheating, and switch the train to a siding for repairs.

Railroads now using the detectors, which cost about $20,000 apiece, include the C&O, the Reading, the Norfolk and Western, the Boston and Maine, the Southern, the Delaware, Lackawanna and Western, and the New York Central.

The Electronics Corporation of America, Cambridge, Mass., makes an aircraft fire detector using a lead sulfide IR detector. The same device could conceivably serve to detect fires in factories instantaneously, before flames appear.

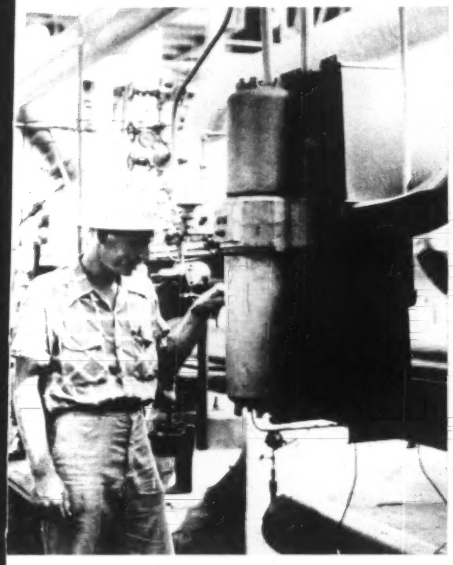
Dimensional Measurement

Infrared detectors can also measure dimension, and without even making contact, if there is a difference in temperature between the product and its surroundings. Since 1951, infrared gages have been used to monitor the width of hot steel strip as it rushes out of the mill at 4,000 feet a minute. The operator can check 100-inch-wide strips to the astonishing accuracy of ⅛ inch. One steel mill is saving $1.5 million a year by using the gage. Engineers are now working on the possibility of using the gage to control the mill.

The only manufacturer of these detectors, Industrial Gauges of Teaneck, N.J., has installed over twenty of these $20,000 systems. (General Electric makes a competitive system using photoelectric cells.)

This year, Industrial Gauges has developed an IR gage to measure the diameter of steel rod as it comes out of the mill. This device is accurate to 0.003 or 0.004 inch.

An infrared gage is used by U.S. Cast Iron Pipe in Birmingham, Ala., to control a centrifugal casting machine. When the pipe has cooled



The quality of ethylene at Gulf Oil's refinery in Port Arthur, Texas, is monitored by this Leeds & Northrup infrared analyzer.

enough to be ejected from the machine, the gage triggers the ejection operation.

Now Industrial Gauges is investigating applications of IR detectors in the glass and rubber industries. In glass pressing, unwieldy thermocouples are used to measure temperatures. IR can do the same job without getting in the way.

There are other applications of IR in process control, but they are being kept under wraps. Because of the convenience, infrared gaging undoubtedly will take over from some present systems or pioneer entirely new measuring techniques in industry's never-ending search for closer control and reduced costs.

Identifying Unknowns Quickly

Identifying unknown compounds is one of the most widespread activities in industrial research and quality control, and an infrared absorption instrument does this far faster than the standard chemical methods. The device, called the spectrophotometer, makes use of the fact

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that each of the millions of different kinds of molecules in existence has a characteristically different vibration frequency in the infrared spectrum. If some unknown material is subjected to infrared radiation, it will absorb certain frequencies in the IR spectrum or a range of frequencies. If the radiation that passes through the sample is then directed through a prism, it is broken up into its component frequencies. When some means of recording the missing frequencies is employed, the resulting "profile" (such as the one shown on page 58) can be studied and the unknown identified. A trained researcher can run off a spectrophotometer profile in a comparatively short time: from fifteen minutes to three and a half hours.

Analysis Without Destruction

Gases and liquids are easiest to work with, but if an unknown solid can be deposited out in a thin transparent film, the spectrophotometer will produce its spectrum too. And the unknown sample is not destroyed, as in most other identification methods.

The spectrophotometer is the oldest and best-known of the absorption instruments, and for that matter of all infrared devices.

A hand-made spectrophotometer was first employed in industrial research at American Cyanamid's laboratories in the mid-1930's. By 1942, the Perkin-Elmer Corporation of Norwalk, Conn., had been licensed to make a commercial instrument. During the war, the IR spectrophotometer proved itself by monitoring production at synthetic rubber plants.

Perkin-Elmer, Baird-Atomic, and Beekman Instruments of Pasadena, Cal., are the American producers of IR spectrophotometers. Among them, these three manufacturers produce about 250 of the desk-top instruments a year, at about the same basic price of $14,000. Thousands are now in use. Although a half-dozen companies make IR spectrophotometers overseas in Great Britain, Germany, and Japan, few if any foreign instruments have been sold here. In fact, American instruments are exported.

The spectrophotometer is a long-lived instrument. As a result, practically all those that have been made are still busily turning out profiles.

When the number of profiles in a lab mounts up, it becomes quite a problem to classify and file them. At Wyandotte Chemical Corporation, Wyandotte, Mich., a punched-card system was developed for this purpose. Whenever a new profile of an unknown is run off, it is roughly simulated on a punched card and all the previous cards are run through an IBM machine. All cards that resemble the new card are segregated and their accompanying profiles are pulled out of the file for quick comparison and identification of the unknown sample. The Wyandotte system has been licensed to Samuel P. Sadtler and Son, Inc., Philadelphia, which sells a basic library of about 1,400 profiles of well-known substances plus the IBM cards.

Here are some of the ways in which spectrophotometers are used in industrial research:

- At the General Motors Technical Center, a home-made instrument studies what takes place in flames. Knowledge gained should lead to better combustion in car motors.
- At Mellon Institute in Pittsburgh, chemists developing new processes constantly check intermediate steps to find out where they are heading.
- At Gulf Research & Development in Harmersville, Pa., the nature of new crudes and the composition of new gasolines is checked.

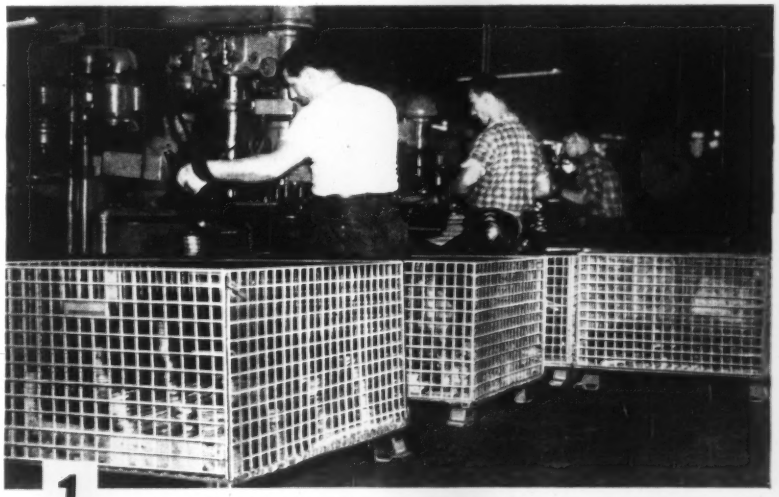
The instrument was also a basic tool in guiding the synthesis of cortisone.

Quality and Process Control

Until recently, the spectrophotometer was considered a laboratory tool for highly trained researchers. Perkin-Elmer has now marketed a comparatively inexpensive ($3,850) model called the "Infracord."

Producing a profile in only twelve minutes, the new instrument can be used by factory technicians for quality control since new profiles can be compared with standard profiles of the product. Undoubtedly, the other manufacturers of IR spectrophotometers will eventually produce this less-refined quality control instrument.

For the small manufacturer who can't afford a spectrophotometer and a Ph.D. to handle it, there are plenty of research and testing labs that will run a sample for about $25. And all three of the manufacturers of the instruments have application labora-



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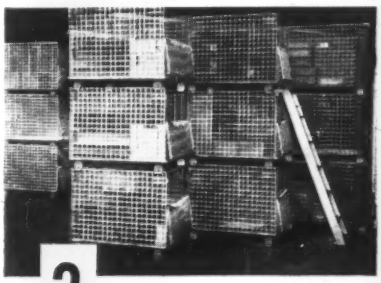

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tories to help prospective customers evaluate the possibilities.

Unlike the spectrophotometer, another infrared absorption instrument, the analyzer, operates over a very small portion of the IR spectrum at any one time. It compares unknown samples with a known standard sample by passing infrared radiation through both. Because of its great sensitivity, essential simplicity of operation, fast action, and ruggedness, it is very effective in process control. It can either monitor a chemical plant stream for contaminants or actually control the process by feedback.

Some infrared analyzers have paid for themselves in only a few weeks of operation. One ammonia plant was able to increase production 30 per cent by using an analyzer to spot contaminants at the parts-per-million level. Analyzers have also helped get new chemical plants "on stream" in weeks instead of months. In addition, they can also sniff out the tiniest leaks in buried gas mains.

Early Failures

Unfortunately, the infrared analyzer got off to a bad start after World War II. One company made a number of inadequate instruments that soured many chemical people on the device. Another firm attempted to make them and then dropped out of business.

It is difficult to fix the blame for these early failures exactly. In some cases the plant operators did not know about contaminants in their streams that damaged the instruments. Also, the apparatus that periodically deliver samples to the analyzer can be cantankerous; they are difficult to build and sometimes cost more than the $5,000 instrument.

Since 1950, both the Liston-Becker Plant of Beckman Instruments, Springdale, Conn., and Mine Safety Appliances, Inc., Pittsburgh, have been making well-received analyzers. In 1952, Leeds & Northrup, Philadelphia, introduced one that has been mainly employed for furnace control, and now Perkin-Elmer makes another. Still, fewer than 1,000 of these instruments are now in use in industry, including home-made analyzers, such as those at Phillips Petroleum in Bartlesville, Okla.

Most of the analyzers can be operated by a technician, but in some complicated situations it takes a

Ph.D. to interpret the data and keep the instrument running.

Infrared may also help solve one of industry's big problems—air pollution. At Battelle Memorial Institute in Columbus, Ohio, scientists have used infrared over comparatively long paths to measure air contamination to less than one part per million.

In Los Angeles recently, 1,000 cars were operated under the usual driving conditions with IR analyzers sitting in their back seats checking what came out of the exhaust pipe. The results may help identify the greatest source of smog—and perhaps take some of the burden off industry.

At Chicago's Armour Research Foundation, scientists are using infrared in crystal studies. Infrared is passed through crystals of germanium and silicon to observe the internal stress pattern. Although no direct application is envisaged, the entire subject of crystal structure is of such fundamental importance to our technology that the program deserves close attention.

Beyond Adolescence

Although infrared equipment is now growing out of the home-made, hand-made era into an off-the-shelf market, it often takes a lot of learning and a lot of fitting before it can be used to best advantage. Frequently, installation and associated equipment cost as much or more than the IR gear. And then there's the continuing outlay for a highly trained or at least intelligent operator. Sometimes the user has to learn a lot more about his process before he can use IR, but then IR will help him to learn a lot about the operation. In some cases the plant or process must be modified or redesigned before IR can do a real job.

The factory manager should not be afraid of IR because it is usually associated with electronics. Other electronic wonder tools are moving into American plants, and managers can demand that skill in electronics be one of the main resources of their maintenance departments—IR or no IR.

The history of infrared is now long enough and the state of the art advanced enough for industry to think of the technique as a mature problem solver. Now is the time to explore the innumerable possible applications that reach into every branch of industry. END

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"Combined savings in handling, retouch time, container costs, packing time and freight since using the wirebound crate amounted to $149,000 in just one year"
Says: Daniel Reiss, Traffic Manager
Electronic Associates, Inc.
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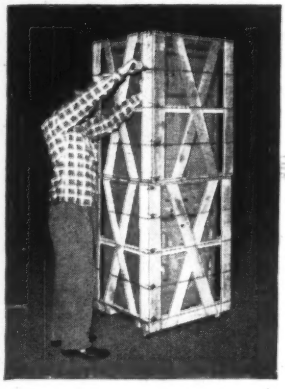
Entire crating operation takes only 22 minutes. After the computor has its final check the two section crate is fastened with Caylor loop fasteners. Before crating, the sides of the computors are covered with kraft paper and the front and back with a polyethylene sheet.



Impressive customer savings like this are made possible by engineering the packaging into product assembly. Electronic Associates, Inc., of Long Branch, N. J. takes advantage of General Box engineering know-how, from the start of final assembly of delicate PACE Analog Computors, until the units are safely installed in the customers' offices. The crate base, fitted with casters, is bolted to the cabinet and serves as a dolly to facilitate handling of the computors during assembly and testing. The dolly-type crate base eliminates the need for lift trucks and reduces aisle space requirements.

When it comes to final crating big savings start to mount. The mass-produced General Wirebound crates cost but a fraction of the price of the plywood cases formerly used and cut packing time 75%. The wirebound crates weigh only 102 pounds—200 pounds less than the containers formerly used. Since most of the computors are shipped coast-to-coast by air this means the customer saves almost $50.00 each in air freight alone.

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General Box

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Ford: Expansion and Challenge 1915-1933

Henry and Edsel Ford examining a model of the River Rouge Plant of the Ford Motor Company. At left are the steel-making units; at right, the foundry and the power house

Executive BOOKSHELF

Company history—with a difference

FORD: EXPANSION AND CHALLENGE 1915–1933 *by Allan Nevins and Frank Ernest Hill. Charles Scribner's Sons, 597 Fifth Ave., New York 17, 714 pages, $8.95.*

The typical company history is more or less a standard public relations effort. The formula runs about like this: "We were somewhat quaint when we started but we were always fair employers, good friends of the community and the customer. We met hard times during the 1930's, but we surmounted them, and grew steadily. Now we are going forward to an even more promising future." Whether anyone but the sponsors and their friends troubles to read histories of this type, or whether they will be of much help to future historians of the economy, is questionable.

This book, the second volume in the Ford history—the first was *Ford: The Times, the Man, the Company*—is the product of an agreement between the Ford Motor Company Fund and Columbia University, but it is by no means a glorification of the company. It is a history in fact as well as in name, written by respected historians, who were given an entirely free hand. It reports both bad and good, and where there is conflicting testimony from those close to the scene at the time, all viewpoints are given a fair hearing.

An illustration of the even-handed justice dispensed by Nevins and Hill is their handling of Ford's employee relations during the period covered. Contrary to the impression given by some other books, these were not all of a piece. Ford, the authors point out, was a good, even a highly advanced employer—if perhaps too paternalistic for modern taste—up until the early 1920's. After that, discipline became harsher and the economic advantages the Ford worker had enjoyed over others in the same industry more or less disappeared. The introduction of the five-day week in 1926, while it undoubtedly gave a push to shorter hours throughout industry, was not an unmixed blessing to those who actually worked in Ford's plants. *Rates* of pay were comparatively high, but weekly earnings were below the industry average. Then, when the depression struck, Ford made his much publicized attempt to counteract the trend by raising wages rather than cutting

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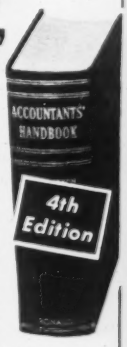

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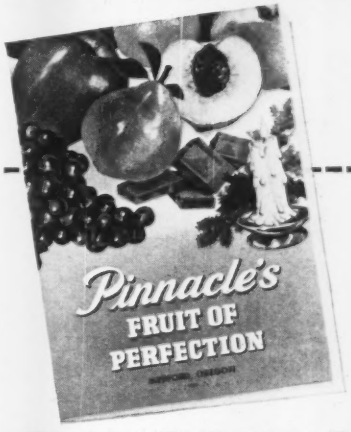

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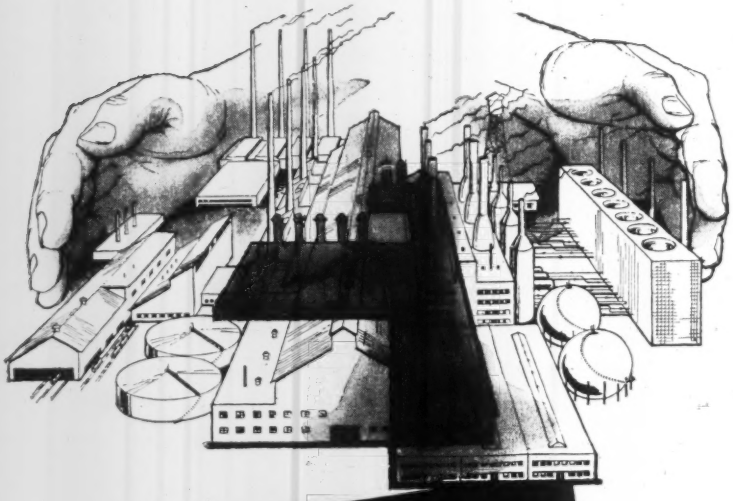

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them. But later on, supervision became even more arbitrary, actually brutal, as Harry Bennett's service men began to play a larger and more obvious role in company affairs.

Similarly, the authors' verdict on Ford himself is that he was a creative man, a man of artistic bent, whose artistry showed itself in the range of his conceptions and in his zest, but at the same time a very ignorant man, susceptible to bad advice, tenaciously prejudiced, and suspicious as only the ignorant can be. (At one time he apparently believed unions were organized by "Wall Street.")

Despite the number of books about Henry Ford and his empire that have already appeared, this one serves a real purpose. Other books have been by associates of Ford, who have necessarily written out of their personal feelings, or by journalists interested in praising or debunking industry, or simply in getting together a "good story" in the newspaper sense. Since the history of the Ford Motor Company is, in effect, the history of the growth of our modern economy, a reasoned, balanced account of it was badly needed.

Certainly this book is far more interesting and informative than the usual company history. In the end it may even do a better public relations job for the company than the run-of-the-mill type.

Surviving in the kid glove jungle

IT PAYS TO BE HEALTHY *by Robert Collier Page, M.D. Prentice-Hall, Inc., Englewood Cliffs, N.J., 285 pages, $4.95.*

TEACH YOURSELF TO RELAX *by Josephine L. Rathbone. Prentice-Hall, Inc., Englewood Cliffs, N.J., 216 pages, $4.95.*

"You," says Dr. Page, addressing the business executive, "are in a kid glove jungle. . . . You must fight constantly just to hold on to the job you have. The battle is unceasing; yet you hardly ever see your antagonists. It is as though you were fighting blindfolded or in pitch blackness." While the situation in most corporations may not be as bad as all that, it is undoubtedly true that the pressures of modern business life account for a good deal of physical illness and mental strain. Dr. Page's book is mainly devoted to an analysis of the situations that are likely to cause psychosomatic illness, together with pointers on how to

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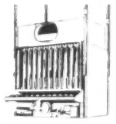

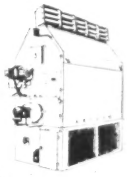

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avoid or minimize them, but it also includes chapters on purely physical diseases and on how to minimize their toll. On the former subject his advice is summed up in the statement: "Know your limitations and live within them." The main defense against latter is, of course, the regular physical examination and strict attention to the recommendations of the doctor.

Dr. Rathbone is a teacher of physical education and a Ph.D. rather than an M.D., but she too is concerned with the effects of the "kid glove jungle." Her book covers the signs of fatigue and tension by which the jungle denizen can recognize his own danger, and the physical and psychological aids to relaxation.

Tax pointers and headaches

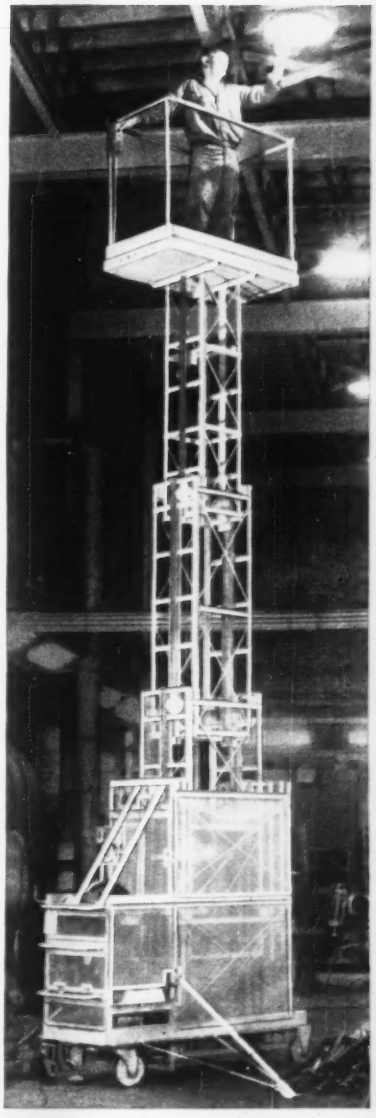
WORKING WITH THE REVENUE CODE—1957, *edited by James J. Mahone, Jr. American Institute of Certified Public Accountants, 270 Madison Ave., New York 16, 192 pages, cloth covers, $3; paper covers, $2.25.*

TAX FRAUD: WHAT THE PRACTITIONER NEEDS TO KNOW TO PROTECT HIS CLIENT *edited by Harry Graham Balter. The Journal of Taxation, Inc., 147 East 50th St., New York 22, 96 pages, paper covers, $2.*

Both of these books deal largely with recent court decisions, and both are intended mainly for the accountant or the lawyer, but business men may find them helpful for reference.

The first is composed of selected comments from *The Journal of Accountancy's* "Tax Clinic" columns, and deals with ways in which an individual or the management of a corporation can lighten tax liability by careful attention to major decisions.

The second book, a collection of articles from the *Journal of Taxation*, is as its title implies concerned with a subject that the honest business man probably gives little thought to, relying on his own clear conscience and the fact that the tax evasion must be "wilful" if a criminal case is to be instituted. But according to one of the authors of this book, "Once the jury is satisfied that the omission of income took place, it will supply the element of wilfulness without any specific proof. . . . There is a growing fear that this is exactly the way the Internal Revenue Service and Department of Justice may look at a situation; and, of course, if that is true, then this is probably the way the special agent in the field looks at a situation."



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The client tends to expect the fees to be related to the amount of money he tends to gain or lose as a result of the lawyer's work. But this may have little relation to the amount of time the lawyer had to spend on the job. A non-exclusive license under a patent may mean an increase of $1 million in annual income; but, assuming that no unexpected obstacles turn up, the legal work can be completed within a day or less. On the other hand, a claim of $20,000 for an unpaid bill may run into a variety of defenses and counter claims and so keep six lawyers busy for a month. If the client gets a bill for $200 on the easy patent contract, he will view the lawyer with favor. A bill for $10,000 on the contested claim will meet with a cold reception. Yet the lawyer would make more per hour on the contract, even though the job requires less skill and experience.

As a rough rule, legal expenses of an industrial company should not exceed 10 per cent of the general and administrative expense, and the average is about 5 per cent. If the legal expenses exceed 10 per cent, the company either has a propensity for trouble or is being overcharged. (These figures may not apply in the small company, since the volume of legal work is likely to fluctuate widely from year to year.)

The Legal Department

Many companies think the solution to unsatisfactory legal service is to establish a legal department, which may mean anything from a one-man-and-stenographer unit up to professional manpower equivalent to that of a large, balanced law firm. Only the latter is properly called a legal department.

There are arguments for and against legal departments. Some law firms patronizingly refer to them as "house counsel" or "kept lawyers," but may themselves be less competent than the departments they slur. Then there are law firms whose intermediate men, to say nothing of their partners, have a more expert and detailed grasp of the subject matter than the company general counsel who theoretically "supervises" their work.

In any event, legal departments

are not for small- or medium-sized businesses, only for big businesses, where the cost of keeping twelve or more lawyers on the payroll may be economically feasible.

The general counsel is the key to an efficient legal department. The idea that he need only be a good administrator is a great mistake. The ideal legal "general," inside or outside, is first a fine diagnostician. He must have the talent and depth of experience to identify legal problems with precision. Legal matters can be deceiving, and the surface problem may hide a more dangerous threat. Then he must know where to find the proper advocate, whether "inside" or "outside," to handle each problem. In short, he has to be a first-class lawyer.

The Liaison Lawyer

Other business concerns must use a different approach. The ideal solution would be to have a legal department without the considerable continuing expense of maintaining it. And this can actually be done if the services of outside lawyers can be organized and utilized in the same way. The company will then have, when it needs them and at a flexible cost, lawyers who are familiar with the business.

One way of doing this is to put a lawyer on the payroll to receive the legal problems from the various executives of the organization and transmit each to an appropriate law firm or specialist. The outsider then works directly with the executive involved, arranging his schedule through the liaison lawyer.

Such a man can do other useful things for the company. While he should not attempt, in most cases, to solve legal problems, or supervise their professional solution, he can handle recurring legal problems of no great complexity. He might also serve as the corporate secretary, since the work of the office is not heavy and legal training is helpful. He could also help out where minor legal problems of personnel management arise—garnishments, for example.

The liaison lawyer must be selected with care. Ideally, he should frankly be without any ambition to be a profound lawyer—which is not to imply he cannot be an intelligent lawyer. Such men are interested in the law in general, but dislike the arduous work and study necessary to achieve stature in the profession or to become expert in a particular field.

The intermediates in large corporate law departments are a good source. Some of them have gone as far as they can go and will appreciate a job that gives them more income without major legal responsibilities. Another possibility is the relatively young lawyer employed by a small law firm; those from law firms large enough to handle the business account may have a tendency to refer all problems to their former associates, which eliminates the advantages of the plan.

This lawyer's function must be clearly defined when he is employed. He must fully understand the limited possibilities of his professional work. If he has been carefully selected, and knows what he is expected to do, the results should be good.

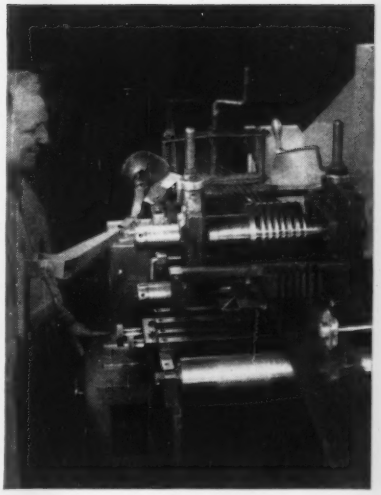
There are some potential disadvantages to this plan. The lawyer so employed may come to feel that he is the company's "general counsel" and assume responsibility for solving the more complex legal problems instead of referring them to outside firms. He may begin to build a legal staff of his own. If management thinks that it is getting the skills of many men in one, the plan will fail. The liaison lawyer is not the equivalent of an experienced general counsel or the senior partner in a law firm. He is simply an alert administrator with knowledge of law.

The Outside Lawyer

Another approach to the problem of legal representation is to retain a member of an outside firm. The lawyer thus chosen becomes the equivalent of a general counsel and his firm more or less acts as a company legal department. Legal problems, instead of being spread among various law firms, are concentrated in one office under the supervision of a single man. Additionally, the business client is not faced with the overhead costs of a legal department.

The selection of counsel is the crux of the problem of satisfactory legal service. A good law firm is judged by the range of the subject matter covered by the partners, the skill of each, and the depth of the echelons behind them. There is no certain way for the business client to make that judgment, but he need not depend entirely on luck.

First of all, he should know how



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not to judge a law firm. It may seem offensive to advise anyone that lawyers should be picked for their legal skill and no other reason. Yet many lawyers are selected for other reasons, even though the client may not realize it.

A certain type of business man "always gets the best." Actually he has no idea which lawyer is the best—if, indeed, anyone is. What he does is retain the biggest firm or the oldest firm or one with historical names. But age and reputation long past are no guarantee of present skill. What matters is the ability of the men in the firm today.

Size can be a somewhat better criterion. At least it means that the firm has had, in the recent past, a substantial clientele, probably because it has been a good firm. In some old large firms, inspiration and training have been passed on from one generation of lawyers to the next, and new men have been selected solely on the basis of talent and aptitude. Other firms have devoted more attention to the "old school tie" and a sort of legal ancestor worship than they have to developing first-class lawyers. Skill in law is an individual talent, however—it cannot be passed on by "institutions."

The "Political" Lawyer

Some business men place their confidence in "influence." This is a mistake. A "political" lawyer specializes in knowing people rather than in knowing the law. In legal problems he seldom does any good. More often than not, hiring him harms the client's case. Many borderline cases have been filed in court because the incumbent officials wanted to avoid the accusation that they made a settlement favoring an ex-official: Career government employees stiffen their backs when the ex-boss appears.

Some clients are attracted to the lawyer's "bedside manner," and more or less unconsciously select him for his social graces. In this they take a greater chance than they would in choosing a doctor on the same basis.

The medical profession has established standards of special training, and a doctor must pass specific examinations before he can engage in specialties. If he is not a surgeon he will not be permitted to operate. The eye man refuses the brain tumor.

The law lags far behind medicine in these respects. It has not set up standards of specialization, although there is a strong body of opinion in the profession that would like to do so. A lawyer can take on any kind of case—taxes today, automobile negligence yesterday, wills tomorrow, and admiralty the day after that. He can try a case or argue an appeal, whatever his talent. Many do, although, to quote Chief Justice Vanderbilt, "It is notorious that many lawyers do not write well and that effective advocates are rarities at the bar." If the client thinks "a lawyer is a lawyer is a lawyer" and so bases his selection on manner, he is likely to make a mistake.

The Right Criteria

Affirmative guides to a proper selection of counsel also exist. To handle the problems of a standard business concern, even a relatively small one, a law firm will need specialists in the legal subjects related to the problems management faces—in essence, production and sales, labor and personnel, finances and taxes. This may require half a dozen partners and an echelon of intermediates.

The firm can be somewhat bigger, but this is no particular advantage to the client. Above a certain size, law firms do not, as a rule, cover any additional specialties. They simply have more work and, therefore, more personnel. For small, specialized businesses the law firm can be somewhat smaller.

A lawyer is a counselor and an advocate. The client has an ideal lawyer if the careful counselor is also an able advocate, but the combination is rare. If the satisfactory counselor is found, he will usually have a partner skilled in advocacy. But it is as a counselor that the lawyer is most often used by the business man. The executive seeks advice to keep him out of trouble and when trouble does come, the first objective is to dissolve it without litigation if possible.

Counsel to business must have special knowledge of one or more legal subjects related to the business world in general, which means he should have had some special training—in a Government agency, by additional study, or perhaps by writing on particular subjects. His continued interest will be shown by activity in the professional organization concerned with his specialties.

But he must have more than special legal knowledge. His background

in the law must be broad so that he can relate a legal problem in his field to one in another field. He needs a working knowledge of accounting, an understanding of the practices and customs of business, and an awareness, at least, of engineering and scientific advances. Furthermore, in this complex age, he must know something of political, economic, and sociological trends and their historical relation to the development of the law.

As a person, he may join in some civic project, engage in some charitable activity, have some hobby. For his career, he will be devoted to his law with no other major business interest or activity. The law is a full-time job.

The Client-Lawyer Understanding

Given reasonably good selection, it is the arrangement with the lawyer and the way it is carried out that, in the final analysis, decides whether anything has been gained or not. The lawyer and his client should have an understanding, preferably in writing.

The lawyer, not his firm, must be responsible to management. His procedure within his firm is his problem. This does not mean that only he sees the executives. Quite the contrary. His juniors and partners should appear freely whenever their particular skills are required. If they do not appear when they might naturally be expected, the lawyer is either afraid they will outshine him or worried over their ability to handle themselves.

Management should, in fact, be given the names of personnel in the lawyer's office who are assigned to specific problems, and executives of the company should be allowed to consult them directly, preferably by memorandum but also by telephone when necessary.

If a lawyer is going to act as general counsel, an annual retainer is generally set, but otherwise there need be none. Annual retainers are a waste of money if the company pays them in the hope of obtaining standby legal services that would not otherwise be available or in the expectation that problems will be handled more quickly. The odds are high that the company could retain the same law firm just as quickly when a problem arose.

Whether or not there is an annual retainer, there should be a clear understanding of the amount and kind of work to be done at a specific cost—study of past legal problems will indicate the type and number likely to arise and the degree of skill required to handle them. When unusual problems occur, the basis for the fee can be set in advance. If there is a retainer, management should be certain it is consumed before extra amounts are billed, and if management feels a bill is too high, it should not hesitate to ask how the amount was arrived at. Lawyers do not generally itemize their bills, but their charges are based primarily on the hours worked, and all lawyers with going practices keep records of the hours; some do so with meticulous care. A good lawyer will not find it hard to supply the information. If he balks, management was probably well advised to ask for an accounting of the charges.

Management's Responsibilities

Management should make it a practice to call the lawyer in early and give him a chance to prevent trouble. There are some executives, perhaps the extra thrifty ones, who think, "I don't need a lawyer for this. It's just like the deal we had two years ago." The vice president who has had a year of law school and fancies himself a good correspondent should be forbidden to draft "a simple letter contract." Letting him do so is always potentially dangerous, frequently a source of trouble, and occasionally disastrous. The odds are that extra legal services will be required in the end. A simple problem can become a costly legal controversy if the business executive tries to be his own lawyer.

Finally, the business man, no matter how pressed he is for time, will just have to reconcile himself to the fact that answers to some legal questions are not clear. He should not demand simple "yes" or "no" answers. He should be willing to read a relatively brief opinion that points out the unsettled area, the factors involved, the degree of risk, and the desirable course. The decision, the course of action his company will take is his to choose.

If the lawyer is wisely selected and his firm is adequate, and if the arrangements are scrupulously followed by lawyer and client, the business man will have satisfactory legal services. END

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ECONOMY IS A WEAPON—National defense must fit the national pocketbook. Now, more than ever before, each element must be weighed against its cost. Northrop Aircraft's budget-minded management is continuing to use technology to achieve low-cost solutions to defense problems. This program brings results in weapons like the Snark SM-62, America's first intercontinental guided missile, the Scorpion F-89 all-weather interceptor series, the Radioplane Division's low-cost target drone and missile systems, and the Anaheim Division's ground-handling equipment, missiles and ordnance products. Latest example of this forward thinking is Northrop's new supersonic T-38 jet trainer airplane, a lightweight, economical member of an entirely new family of military aircraft which reverses the trend of rising costs. The T-38 can save hundreds of millions of tax dollars, and help provide the free world with the weapons of powerful military strength and vigorous economic solvency.

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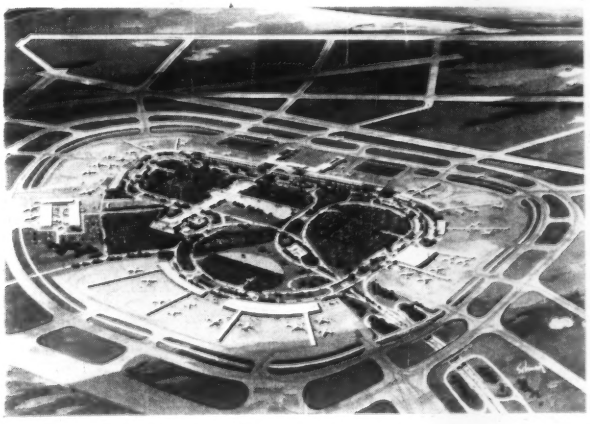
INTERNATIONAL TRAVEL AIDS WORLD TRADE

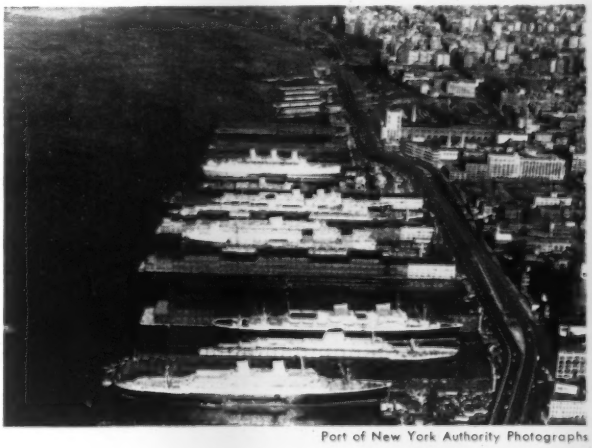
Whether he travels for business or pleasure, the American executive is developing a deeper insight into the world's needs, is returning home with new ideas, new techniques. Along with this is an immediate plus factor: trade deficits are being offset by the dollars U.S. tourists spend abroad. The travel statistic is fast becoming an important indicator of the dollar position of overseas markets.

"ANNOUNCING the departure of flight for London—Paris—Frankfurt—Rome" and to points east, west, north, and south. That chant is heard many times daily at New York City's busy Idlewild International Airport, gateway to the world. And across town warning whistles accent the bustle of departure as the white sunliner moves leisurely from its pier, outward bound to the warm latitudes of the Caribbean and South America. These are brief glimpses of the vast machinery of international travel that today involves the movement of more than 1.2 million U.S. travelers abroad and feeds more than $1 billion net into the dollar-hungry exchequers of some 90 countries of the world.

Travel, like trade, follows a two-way lane, and traffic patterns vary in volume and time. Some countries send more travelers and spend more than they receive in tourist currency. For others, the tourist trade brings in sizable dollar balances to help to offset or reduce trade deficits. Canada, which in 1956 wound up with a minus balance of $1 billion in its trade exchange with us, also took a loss of $75 million on its U.S. travel exchange: only $316 million in as against $390 million out, not including costs of transportation. Mexico received $279 million in tourist dollars, spent $123 million in reverse travel, and so had a comfortable yield of $156 million to offset part of its 1956 U.S. trade deficit of $440 million. Because of their more constant climate, their proximity, and their growing wealth, the West Indies, Central America, and South America are building up their tourist popularity and profits. Combined statistics show a $67 million net return to the countries in this zone; U.S. travelers spent $163 million there in 1956, and reverse travel outlays amounted to only $96 million. Oddly enough, the emphasis on tourism as a business in this area seems to wane or expand in loose inverse relationship with trade volume. South America, which cleared a favorable balance of $532 million in its U.S. trade exchange in 1956, developed only $29 million in travel income. Central America, a much smaller area, attracted $10 million tourist dollars in modest offset to its $92 million trade deficit, while the British West Indies experienced a loss of at least $122 million in trade but garnered $124 million in travel income. Bermuda, which has little in the way of export-



New York's busy International Airport at Idlewild is modernizing its plant to handle the increasing traffic of international air travel. Last year, 900,000 Americans went overseas by airplane.



Port of New York Authority Photographs

Quietly lying in their berths on New York's West Side, several of the world's superliners wait for the onrush of Americans who prefer to travel by sea. In 1956, there were 327,000 of them.

CANADA: No. 1 tourist spot for Americans, our northern neighbor's variety of vacation areas and historical landmarks drew some $316 million from American tourists in 1956.

able products, has wisely made tourism its No. 1 business. The $17 million it spent for U.S. commodities last year was recaptured with plus margins from the steady stream of tourists who poured $26 million into its hotels, shops, and clubs.

But sharply highlighted in the travel picture is Europe. Its antiquities, its colorful traditions, its popular museums and amusement spots, its cold weather and hot weather resorts, and—not least—its expanding commerce and industry attracted U.S. travelers in droves. Roughly half of the U.S. voyagers abroad (521,000) had Europe and the Mediterranean area as their destination. Most (51 per cent) were on tour for pleasure; some 13 per cent traveled the air and sea lanes on business, while a small group (5 per cent) combined business with pleasure. The rest were travelers on personal business or visiting relatives.

Tourists and Dollar Deficits

In its 1956 report on foreign travel, the U.S. Department of Commerce, Office of Business Economics, estimates that of the total tourist bill of $1.275 billion (not including $539 million for overseas transportation) almost a half billion dollars ($473 million) was put into exchange circulation in twelve countries of Europe and some areas of the Eastern Mediterranean. This fiscal statistic has restored a smile to the face of many a harried government official and has eased the process of assimilating some rather uncomfortable trade imbalances. The loss of dollars through reverse travel has been modest—it absorbed only $68 million, and

SOME TIPS TO TOURISTS ON REGULATIONS AND

COUNTRY	PAPERS	CURRENCY RESTRICTIONS
EUROPE		
AUSTRIA	Passport, no visa for 3 months	No limit on schillings in, 10,000 out
BELGIUM	Passport, no visa for 3 months	None
DENMARK	Passport, no visa for 3 months	500 kroner in or out
FINLAND	Passport, visa, no fee, valid for 3 months	20,000 marks in, 10,000 marks out
FRANCE, FRENCH NORTH AFRICA	Passport, no visa for 3 months	No limit on francs in, 20,000 out
WEST GERMANY	Passport, no visa for 3 months	None
GREAT BRITAIN	Passport, no visa for 3 months	10 pounds in or out
GREECE	Passport, no visa for 2 months	400 drachmas in, 200 drachmas out
ICELAND	Passport, visa with 1 picture	No Icelandic currency in
IRELAND	Passport, no visa	No limit on Irish pounds in, 10 British pounds in; 10 pounds out
ITALY	Passport, no visa for 6 months	No limit in, 30,000 lire out
LUXEMBOURG	Passport, no visa for 2 months	None
NETHERLANDS	Passport, no visa for 3 months	1,000 florins in or out
NORWAY	Passport, no visa	300 kroner in, 99 kroner out
PORTUGAL	Passport, no visa (visa needed for Azores, fee $3.67)	None
SPAIN	Passport, no visa for 6 months	10,000 pesetas in, 2,000 out
SWEDEN	Passport, no visa for 3 months	1,000 kroner, in denominations not exceeding 100 kroner, in or out
SWITZERLAND	Passport, no visa for 3 months	None
TURKEY*	Passport, no visa for 3 months	100 liras in or out
YUGOSLAVIA	Passport, visa with 2 pictures, fee $1, valid for 1 month	3,000 dinars, in denominations not exceeding 100 dinar, in or out
WESTERN HEMISPHERE		
ARGENTINA*	Passport, no visa for 90 days	None
BOLIVIA	Passport, visa, 1 extra picture	None
BRAZIL*	Passport, tourist card from transportation company, valid for 60 days, 2 pictures (no charge)	None
CHILE*	Passport, no visa for 3 months	None
COLOMBIA*	Proof of nationality; tourist card, no fee, 2 pictures, valid 90 days for multiple entry within 4 years, round-trip ticket	None
COSTA RICA*	Passport, tourist card for 30 days; fee $2 for 30 days, entry to be within 90 days of issue, return ticket	None
CUBA	Proof of nationality, tourist card valid for 2 years, fee $2.50	None in; $50 cash out
DOMINICAN REPUBLIC	Passport or proof of nationality, tourist card from transportation company, fee $2, valid for 15 days	None
ECUADOR*	Passport, tourist card, fee $1, 2 pictures, valid 90 days, proof of trip from transportation company or round-trip ticket	None
EL SALVADOR*	Passport, visa with 1 picture, police certificate, return ticket or $250 in cash or tourist card, valid 2 years, no fee	None
GUATEMALA	Passport or proof of citizenship, tourist card for 6 months, to be used within 60 days of issuance, fee $2	None
HAITI	Passport, or proof of citizenship; for tourist card issued on arrival, fee $1, valid 30 days	None
HONDURAS	Passport, visa, 2 pictures, no fee, valid 60 days	None
MEXICO	No passport, proof of citizenship; for tourist card, fee $3, valid for 6 months	None
NICARAGUA*	Passport, visa, no fee, 2 pictures, valid for 60 days, police certificate or tourist card, valid 30 days	None
PANAMA	Passport or proof of citizenship; for tourist card, 2 pictures, fee $1, valid for 15 days; return ticket	None
PARAGUAY*	Passport, visa, fee $3.25, valid for 3 months, but extendable; police certificate	None
PERU*	Passport, return ticket or tourist card, fee $2	None
URUGUAY	Passport, no visa for 3 months	None
VENEZUELA	Passport or birth certificate for 1-month tourist card, 4 pictures, letter from employer stating it is a pleasure trip, return ticket, letter of reference from bank or tourist card valid up to 1 month	None
AFRICA, ASIA, AUSTRALIA		
AFGHANISTAN*	Passport, transit visa good for 4 months, 8 pictures, bank statement, proof of onward transportation, fee $10	None

REQUIRED DOCUMENTS FOR TRAVEL ABROAD

COUNTRY	PAPERS	CURRENCY RESTRICTIONS
AUSTRALIA	Passport, visa, no fee, valid 1 year	4 pounds out
BELGIAN CONGO*	Passport, no visa for stay up to 8 days for plane passengers only; for boat passengers, visa, 2 pictures, police certificate of recent issue, round-trip ticket	None
BURMA*	Passport, transit visa, 42 cents for stay of up to 10 days, visa for next country and through ticket or entry visa, $2.10 for stay up to 3 months; good for 10 days by boat, 24 hours by air; fee $3.15 for 30-day stay	No limit on U.S. dollars, only 100 kyats
CEYLON*	Passport, visa for 1 or 6 months	10 pounds in or out
CHINA (Taiwan)	Passport, visa, 2 pictures, valid 1 year, proof of onward transportation	$200 out
EGYPT*	Passport, visa, letter from travel agent, 2 pictures	20 Egyptian pounds in or out
ETHIOPIA*	Passport, visa for 3 months, 3 pictures, financial statement, police certificate	$100 in Ethiopian currency out
HONG KONG*	Passport, visa with 2 pictures, fee $2, valid 6 months from date of issuance, no visa for air travelers staying only 48 hours	None, no gold permitted
INDIA*	Passport, entry visa, fee $2, 4 pictures, valid up to 6 months; return ticket or bank reference	10 British pounds in, 250 rupees out
INDOCHINA (Cambodia, Laos, South Vietnam)	Passport, visa	400 piastres in
INDONESIA*	Passport, visa with 3 pictures, fee $3.30, valid 30 days, proof of transportation in and out of country, letter from travel agent that traveler is bona fide tourist; visa valid for entry 3 months from issuance	No rupiahs in or out
IRAN	Passport, visa with 2 pictures, no fee	500 rials in or out
IRAQ	Passport and visa, either transit visa valid 3 months or more or entry visa for 1 year, fee $6.16, letter from transportation company listing all countries visited on trip, permits stay up to 2 weeks, no fee	None
ISRAEL	Passport, no visa for 3 months	No Israeli currency in or out
JAPAN*	Passport, visa, no fee, valid 4 years, return ticket	No yen in or out
JORDAN	Passport, tourist visa issued upon entry, 2 pictures, church certificate required	None
LEBANON	Passport, visa, 1 picture, fee $5; return ticket or letter from travel agent stating length of stay	None
LIBERIA*	Passport, visa, 3 pictures	None
LIBYA	Passport, visa, 2 pictures, valid 5 days and extendable, or entry visa valid 30 days, letter stating purpose of trip	None
NEW ZEALAND	Passport, visa, 2 pictures, fee $2, valid within 2 years	No limit in, 7 pounds out
PAKISTAN*	Passport, visa, no fee for 2-week transient visa for single entry, or multiple entry visa for longer stays, visa for next country and proof of outward transportation, financial guarantee needed for longer stay	500 rupees in, 50 rupees out
PHILIPPINES*	Passport, visa, 3 pictures, no fee, valid 59 days; transportation and visa for next country	100 pesos in or out
SAUDI ARABIA*	Passport, visa up to 3 months, 3 pictures, letter from employer stating purpose of trip, and financial statement; letter from airline indicating round-trip ticket is held	None
SINGAPORE	Passport, no visa for 3 months	10 pounds in
SOUTH AFRICA*	Passport, visa, no fee, valid for entry within 12 months for stay up to 6 months	Variable amount out
SYRIA	Passport, visa, 1 picture; fee $6.95; valid for 6 months	None
THAILAND	Passport, no visa up to 1 month	500 baht in or out

Health Documents: In order to get back into the United States, every citizen going abroad must have a valid smallpox vaccination certificate showing that he has been vaccinated within three years prior to the date of return from overseas. In addition, tourists who do not arrive in a foreign country directly from the United States, or who pass through yellow fever areas during their journey, may be required to possess other health documents before they will be permitted to enter foreign countries on their route. In case of doubt, check U.S. health officials as well as consulates of countries that are to be visited.

*In addition to vaccination certificate, other types of inoculation or a certificate of good health are required or recommended. Specific information is available from local consulates or transportation companies.

Chart based on information originally compiled by *The New York Times* and revised to September 1957 by DR&MI.

left the bulk of the dollar fund ($405 million) available to meet the pressing bills of international commerce. How much U.S. travel dollars contribute to the welfare of some countries can be grasped by studying imbalances in trade with United States in relation to travel income (1956 figures, in millions of dollars):

	Trade Deficit	Tourist Income
Italy	$ 307	$ 94
France	322	85
U. K.	178	82
Germany	286	53
Switzerland	40	38
Scandinavia	119	29
Spain	185	21
Benelux	129	20
Austria	29	14
Eire	20	11

The dollar gap of this group, whose net imbalances totaled $1.615 billion, obviously acts as a trade depressant, but the effect is lightened by two economic facts: first, U.S. tourist disbursements amounted to $447 million; second, by-product income from fares paid to foreign carriers (mostly European owned) came to $238 million. In round numbers the whole offset was $685 million, or 42 per cent of the deficit.

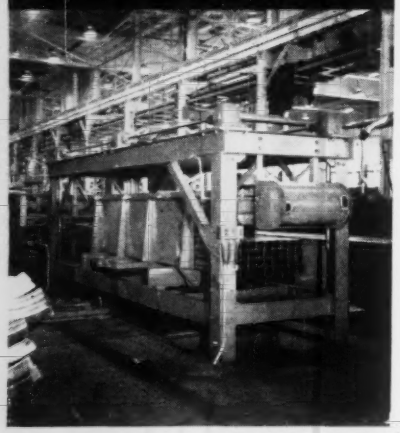
It is apparent that the contribution made to the European economy by travel is substantial. Any sharp reduction in this area of U.S. spending would have massive repercussions on international trade.

Looking at Asia

The Far East, with a string of trade deficits adding up to $604 million, could well use travel income, but it attracted only $36 million worth and spent a considerable

MEXICO: In Monterey, American tourists can run into familiar sights transplanted to new settings. Last year, Mexico's tourist income amounted to some $279 million.

PLANET SYSTEM FLOATS EXCESS STOCK



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This Planet system, which was recently installed in an auto plant, automatically handles frame members from tube forming to assembly. Its outstanding feature is the stacker illustrated which provides an automatic float for tubing formed in excess of immediate production requirements. In this installation, the stacker accumulates and bands the tubes on dollies for live storage. This permits efficient use of the forming equipment at timed intervals, while supplying assembly with a steady flow of tubes.

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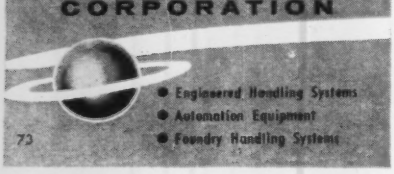


1835 SUNSET AVENUE LANSING, MICHIGAN

ITALY: Milan's Trade Fair, one of Europe's oldest, was one of that peninsula's many attractions for the 259,000 American tourists who last year spent $94 million there.

part of this in reverse travel. Possibly because of its remoteness, the turbulent political climate, the uneasy economic atmosphere, and the high cost (in both time and money) of getting there, the Asian area holds out comparatively limited inducements to the U.S. traveler. And it may be some time before the bazaars, the pagodas, the Balinese ballet, and other attractions offered by the Orient divert the attention of the American traveler from the bistros, museums, the medieval churches, and castles of Europe.

Economic Guideposts?

Because of the volume of money exchanged and the number of countries involved, *travel statistics are acquiring stature as a rough economic index.* But the supporting data are necessarily fragmentary because of the complexities of travel. How much people spend, where they go, and for what purpose is a matter of projection based on random responses from sample groups of travelers. The number of passports issued is an inaccurate indication for obvious reasons—more than one trip can be taken on one passport issue and the original itinerary can be changed. Item: the spontaneous excursion of 41 U.S. students to China. As a comparative "guesstimate" the trend in travel by number and destination has some value. But it is to the expenditures column that we have to look for the real values of travel to the economic balance sheet of the world, and to find this we have to go outside the area of Government statistics.

While in 1956 U.S. expenditures abroad were estimated at $1.275 billion, travelers' checks, the international coin of exchange, were issued in a volume approaching the $3 billion mark, with the American Express Company in the forefront as the travelers' international banker. And this figure does not give effect to checks sold by Thomas Cook and Sons Ltd., in which the British government is part owner. Nor does it include checks drawn on U.S. banks and cashed abroad by tourists tempted by that sports car, that unusual but expensive antique, or troubled by some unanticipated expense. And what of the items bought on the basis of, "Ship now and I'll pay when I get back to the States"?

The Non-Tourist Class

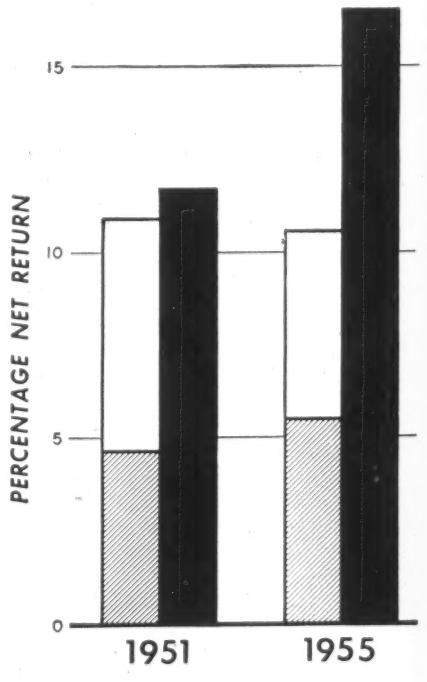
Then there is the money spent by the thousands of American citizens staffing the branches of U.S. companies abroad, many of whom might be considered in suspended travel. Then, too, our Government itself runs a travel service of robust proportions. And finally, the weekly paychecks of the U.S. Armed Services, who are paid in MPCs (Military Payments Certificates) run into a multimillion dollar figure monthly, some of which finds its way into the local markets. These several currency conversion items are not tabulated in the statistics. But they swell the total of money spent abroad, and help buttress the dollar reserves of Germany, France, England, Morocco, Japan, and other areas. Moreover, the purchases by U.S. citizens stationed abroad are repetitive, and include U.S. exports as well as foreign goods.

The kinds of possessions these Americans carry with them demonstrate graphically the American system of handling the daily chores by mechanical means. Their need of services brings them in contact with nationals in all walks of life, and the contacts lead to some absorption of American ideas and ideals. The household freezers, the data processing equipment, and the electronic controls for presses may seem a bewildering mixture of apparatus to the average national abroad who sees them on display at the popular trade fairs, in the homes, and in the workshops of U.S. business abroad. Yet our overseas contemporaries are fast learning to live more effectively in this age of technology. And they are making their own contributions in in-

Four facts manufacturers should know about plants and profits in Puerto Rico

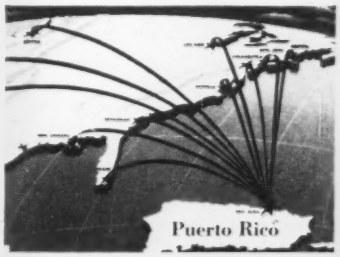
American industry has built over 450 new plants in Puerto Rico during the past six years. Some have actually tripled their normal profits. Here are some reasons why U. S. manufacturers are doing so well in Puerto Rico.

1. AVERAGE NET RETURN ON SALES IS 3 TIMES AS HIGH AS IN THE U. S.



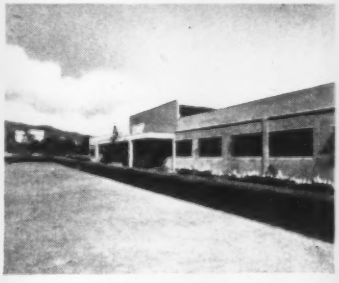
Why your return on sales is higher in Puerto Rico. Production costs are unusually low in Puerto Rico. Hence your net profit from a new plant can be dramatically increased. A cost study made for one manufacturer showed that his net unit profit of $4.04 from a U. S. plant would rise to $14.08 in Puerto Rico! Look carefully at the chart.

2 Freight rates to the U. S. are low. Over ninety per cent of Puerto Rican products are sold in the United States. Money, people and goods move as freely between Puerto Rico and the U.S. as between the States of the Union. Freight costs are low and there is no duty on trade with the U.S.



3 Abundant, skillful labor. Puerto Rican workers have reached remarkable levels of productivity. Such diverse companies as Remington Rand, Union Carbide Corporation, St. Regis Paper, Beaunit Mills and Univis Lens are already running successful plants. The Commonwealth will train workers especially for your operation.

4 Modern plant buildings—ready to occupy. You could move into one today. Dependable power, at reasonable rates, is waiting to be connected. Rents are low and the Government can arrange favorable financing. Currency is the U. S. dollar. A common legal system ensures that all your interests are protected by both the Commonwealth and U. S. Constitutions.



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Mail me "Facts for the Manufacturer," with information about my particular industry.

Name_____ Title_____

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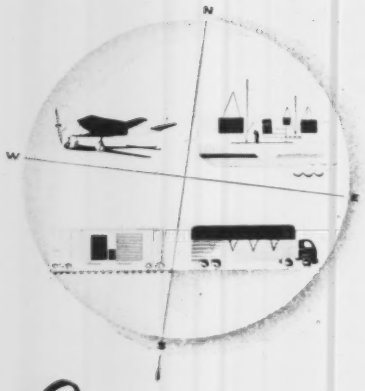
Address_____

Product_____



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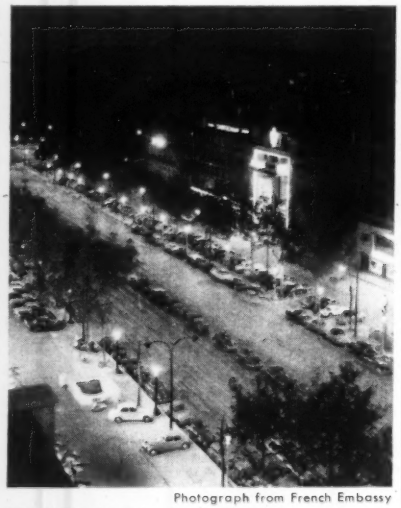
ventions and adaptations, some of which are being put to use in American industry and commerce today.

Mutual Understanding

To study the impact of travel from the cold, statistical side alone would be to ignore important underlying values. Americans and foreign nationals are learning to understand each other better. The strange and curious ways of the natives may sometimes be irksome, but the postwar American is more sophisticated, more tolerant of a limited supply of the comforts of life than his prewar counterpart. And because he is now more at home abroad, he is more receptive to the unusual facets and products of life in the outposts of the world. The curios, the fabrics, the furniture, the exotic foodstuffs that he buys in staggering amounts and displays proudly to his neighbors are recreating interest in imported products and developing new markets in the United States for the goods of the world. Many U.S. department stores these days have at least one counter devoted to the display of slim glassware from Sweden, rich fretwork from Italy, gay-colored pottery from Mexico, or cultured pearls from Japan. And while his intention may be pleasure, it must be a rare U.S. executive who shuns his business counterparts abroad. It is reasonable to think that numerous business contracts have developed, and led to new trade partnerships that broaden the horizon of American



Photograph from French Embassy

FRANCE: Paris's Champs Elysees, famous for its smart shops and sidewalk cafes, is one reason for France's popularity. Last year, 300,000 Americans spent $85 million there.

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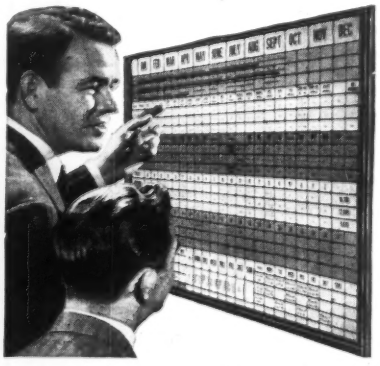

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commerce and industry abroad. The accelerated growth of U.S. investments abroad (now at $22 billion), the rising level of imports ($12.4 billion), the sharp gain in exports ($17.3 billion) to some extent stem from the casual meanderings of Americans abroad.

Leaving an Impression

Moving through Europe at a leisurely pace—an average 43 days for plane, 71 days for ship travelers—the American has time to observe and be observed. His gadgets, his sometimes gauche but sincere comparisons between European and American "conveniences," his word pictures of the apparatus available to make the mechanics of living easier have left their imprint. If some of the repercussions have been odd—hot dog and hamburger stands in France and medieval castles converted into dollar-a-night motels in Germany—others have been more profound, deeply influencing industrial and commercial patterns. The advent of the supermarket in Italy, the adoption of instalment credits as a sales spur in France, the installation of assembly line techniques in Italy's factories and central heating in England are dramatic illustrations of this trend. Even U.S. styles in men's shirts are now being copied abroad. For an area readying itself for a common market, what better preparation for mass production and mass distribution?

Whether it is cause or effect the fact remains that in the last several years travel regulations to Europe have eased, making life much easier for the American tourist who wants to shuttle from one country to another. But Latin America's travel regulations (like our own) bristle with tough requirements and needless complexities. There has been much talk but so far little action on simplified travel to the Latin American coast. But as more American business

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For help in developing some interesting highlights on the travel story in this issue, grateful acknowledgment is made to the American Express Company, especially George F. Doherty, Jr., vice president; James K. McArthur, director of publicity; M. E. Lively, assistant vice president; and staff members J. B. McAnulty and Hilda Harrison. Also to Lynn Beaumont, director of public relations of the American Society of Travel Agents Inc., publisher of *ASTA Travel News*.

SYNTRON

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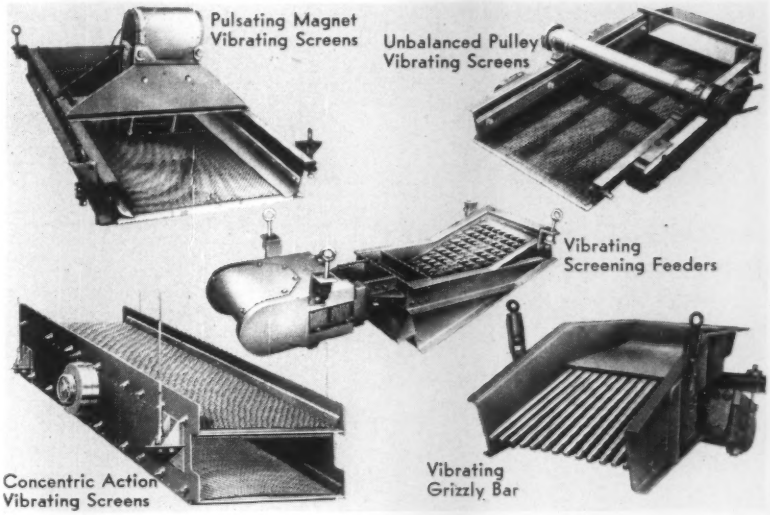
for every Screening Problem



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Now, SYNTRON can provide a screen for every screening problem—whether it's scalping, coarse screening and feeding of basic materials, control of material particle size in processing quality materials, or reclaiming waste materials for re-use. SYNTRON'S Vibrating Screens provide an efficient, economical answer.

SYNTRON Vibrating Screens are simple and functional in design. Their smooth, high speed vibrating action utilizes the entire screening surface for fast, effective separation of all types of materials.

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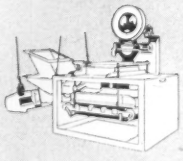
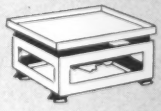


PACKERS AND JOLTERS



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Stability: Year after year, on the average, it loses the fewest man hours (per hours worked) due to work stoppages.

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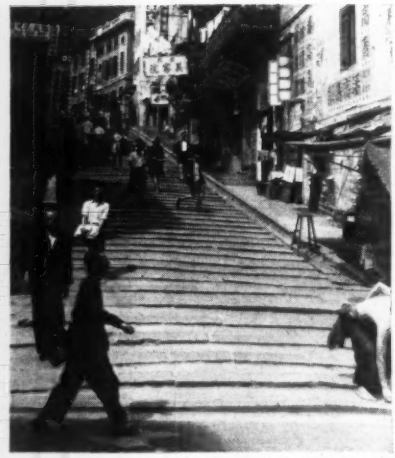
Commissioner of Commerce



Pan American World Airways Photographs

HONG KONG: The ladder streets, so steep they are terraced into steps, house Hong Kong's famous tailor shops where suits are tailor-made in production line techniques.

moves to more countries and travel interchange expands, the mounting pressure for easing travel restrictions may improve the mechanics of moving about south of the border.

Alert American business men seeking new markets, manufacturing methods, and products are taking a tip from the merchants of the Middle Ages. By the tens of thousands, they will be flocking to the great international trade fairs slated to take place in Europe early this Fall and throughout 1958. The U.S. business man—rubbing elbows with merchants from Germany, Japan, South Africa, and Brazil—will find these exhibitions dazzling showcases of the world's newest products and processes. In flag-decked pavilions, lighted by floodlights, he will see literally thousands of displays ranging from dyestuffs to dynamos, fine foods to furniture, locomotives and packaging equipment to jewelry and lingerie. He may come to buy or to sell, but chances are that he will bring home a much broader perspective and a more receptive attitude to the global aspects of trade and industry.

The reciprocal flow of ideas, products, and people stimulated by international travel is difficult to evaluate on a weights-and-measures basis. But in terms of our international relations, the coin we receive in cultural gains, fresh ideas, and a better understanding of people the world over can best be paraphrased as "dollars cast upon the waters." —A. O. S.

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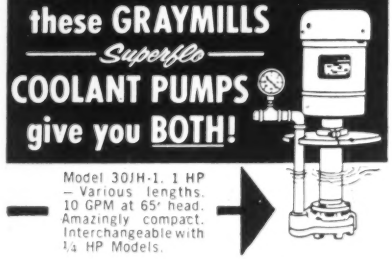
Need Pressure AND Volume? these GRAYMILLS Superflo COOLANT PUMPS give you BOTH!



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These compact, dependable coolant pumps can give you up to 10 GPM *at* 65 ft. head. They provide abundant flow even through a maze of pipes.

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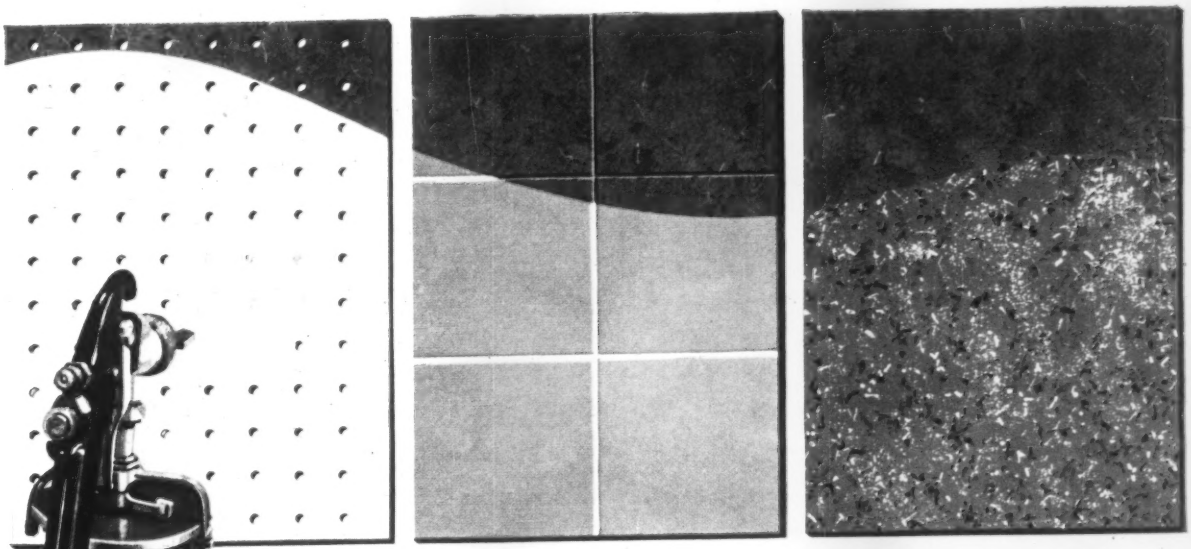

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How Arthur F. Brown, with an assist from chemistry,

puts color in

"**High-fashion wallpaper** and uniform pigment colors require unceasing research and painstaking craftsmanship to produce," states Arthur F. Brown. "They also call for the highest quality raw materials. We know from experience that Wyandotte meets our exacting standards. But more than that, they're always on tap to supply technical help should we need it . . . assistance that is deep-rooted and sincere, as well as practical."

your life!

TIRED OF living in a drab world? Want an emotional lift? Then turn to color!

When you do, chances are a dynamic man from Glens Falls, N.Y., will have a hand in it. For, Arthur F. Brown heads the world's largest chemical-pigment color plant, Imperial Paper and Color Corporation. Under his guidance, raw materials gathered from all parts of the globe are transformed into pigments for use in everything from paint, ink, paper, rubber, plastics, and textiles to the firm's own famous wallpaper line.

"The future for color is bright," Mr. Brown relates. "Everything you see, eat or touch will soon be more colorful—making it vital in nearly every industry's battle to win business.

"But, like any major trend, endless research is required. It's not enough that we alone should be research- and new-product-minded; we expect it of all our chemical suppliers, like Wyandotte. This makes for progress — lets you enjoy the benefits of beautiful, uniform colors at practical prices."

How about *your* business? If you're seeking a reliable source for raw-material chemicals, jot down this address: *Wyandotte Chemicals Corp., Wyandotte, Michigan. Offices in principal cities.*

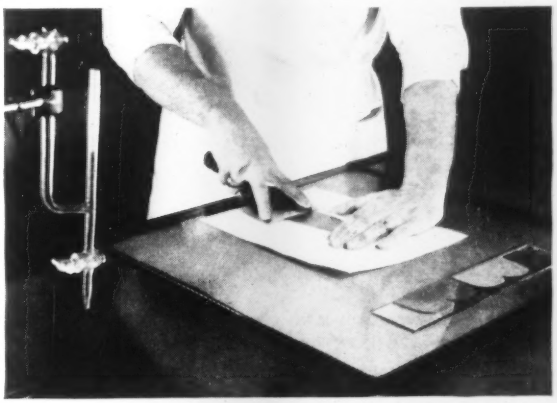
*REG. U.S. PAT. OFF.

Wyandotte

CHEMICALS

Pacing progress with creative chemistry

2 **Whirling inferno.** Imperial produces chromate pigments of many hues by roasting chromite ore and Wyandotte Soda Ash in giant rotary kilns. As an economical alkali, Wyandotte Soda Ash is indispensable to nearly every industry — glass, paper, chemical, metallurgical, textile — to list just a few.



3 **Pull-down test** at Imperial gives quality check on pigment, paint or ink formulas; determines uniformity of shade, strength, gloss and other characteristics. Formulations for paint and ink often call for Wyandotte PURECAL*—to improve uniformity, brightness, hiding power, and dispersion; eliminate settling.

4 **Looking for answers?** Technical help from Wyandotte may take the form of a conference like this, an assist from our research lab, or data on new uses for established chemicals; often can spark new ideas, save duplication of research. *When you have a chemical problem,* call on Wyandotte!

INTERNATIONAL REVOLVING DOOR ENTRANCE AT REPUBLIC NATIONAL BANK BUILDING, DALLAS, TEXAS. 1956 OFFICES OF THE YEAR AWARDS WINNER
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MOST MODERN TODAY

. . . and many tomorrows to come!

Symbolic of the great Southwest's accelerated progress, this new Dallas bank building also typifies most of today's outstanding structures in its choice of entrances. Here, as in major buildings throughout America, only revolving doors — that are "always open," yet "always closed" — could measure up to *all* modern entrance requirements. No other entrance design was considered since previous experience had required the replacement of swing doors by International revolving doors.

Whatever the building location, an International Revolving Door Entrance is a sound investment in year-round comfort, cleanliness, and cost-saving efficiency. *If you have entrance problems which cost you money — you are already paying for revolving doors.* Write for the proof, *now.*

New "Manual of Modern Entrance Maintenance" sent to head of your maintenance department upon receipt of his name — request free copy on your letterhead. The nationwide International service organization is available at your request.

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INSIDE INDUSTRY

New Methods, Materials, and Equipment

- *Is Russian Technology Catching Up?*
- *Low-Grade Ores Are Now Economic*
- *A Portable Electricity Generator*
- *Putting Aluminum on Ice*
- *Analyzing Engine Performance*

Russia hot on our heels?

Evidence continues to mount that the Soviet Union may be catching up with American technology. Dr. Otto Schmidt, an experimental engineer with Kearney & Trecker, machine tool builders in Milwaukee, Wis., says that current Russian textbooks on machine tool technology are superior to anything available in the United States. The material represents an amalgam of the best thinking on the subject in Western Europe and the United States, and the authors obviously know what they are talking about, according to Dr. Schmidt. Each of the books begins with a chapter glorifying Russian "firsts" in technology, but after that the authors get down to business and discuss machine tool design on an impressively advanced level.

However, William P. Lowell, Jr., a Sylvania Electric engineer who has just returned from a trip to Moscow, reports that Russian illuminating standards and practices are far behind ours. In lamps and electric products they are 20 to 25 years behind, he says, and although they are narrowing the gap, and "making do" pretty well with what they have, it may take them another 25 years to catch up. Lowell was one of a 25-man American delegation to an international technical conference.

Extending our resources

For many years the United States appeared to be amply endowed with iron ore. Now we are importing high-grade iron ore from as far away as South America. If our resources of taconite, a low-grade iron ore containing a high percentage of impurities, could be utilized, we would be less dependent on imported ores.

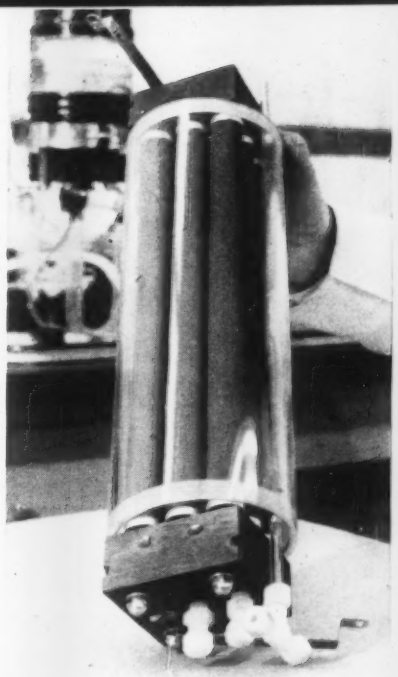
Allis-Chalmers of Milwaukee has announced a new process for "pelletizing" and heat-treating concentrates of taconite, which should help make it competitive. In order to remove the impurities at the mine, the ore is crushed into a fine powder. But the "beneficiated" powder can't be easily loaded into ore ships or used in blast furnaces. The answer is to form it into hard pellets.

Previous pelletizing processes were limited by high equipment, fuel, or maintenance costs, or did not produce a strong enough pellet. Allis-Chalmers claims that the new process avoids these limitations.

At present, about 2.6 million tons of taconite concentrates are used each year. By 1965 it is estimated that about ten times as much will be flowing into American steel mills. During the same period, imports of high-grade ore should rise from 27 to 52 million tons.

Electricity from gases

Since the war ended, new methods of generating power have been gaining an economic place for themselves. First came the gas turbine, then atomic power, and now the direct production of electricity from gases. Although it may be years away from actual production, a silent, portable fuel cell of high efficiency has been developed, and has already powered a small portable radar for ground troops in a demonstration. Using hydrogen and oxygen as fuel, the power source has an optimum output of about 1,000 watts.



Electricity is directly produced by gases in this fuel cell. Developed by National Carbon, the experimental unit could power remote relay stations. A porous carbon rod is the key to the operation of the fuel cell.

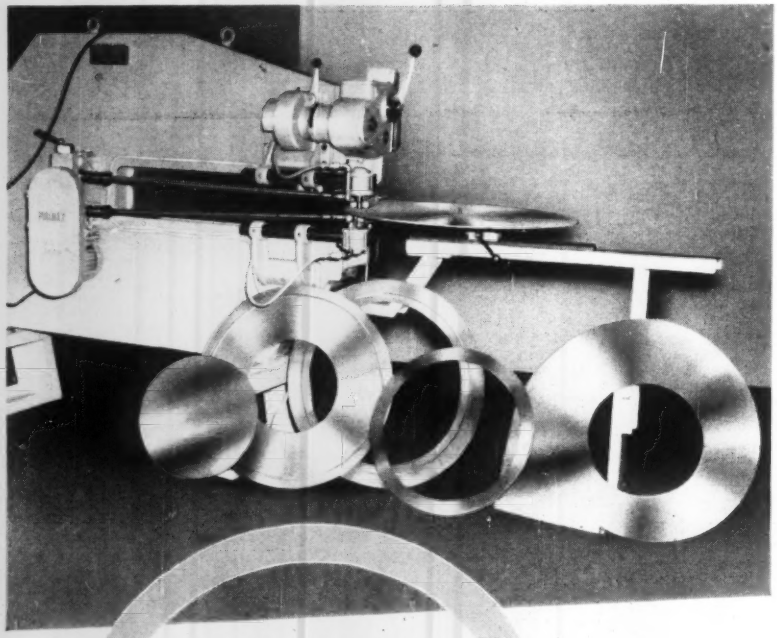
A number of scientists have been interested in the fuel cell, and the British actually unveiled a laboratory model several years ago, but the honor of producing the first economic fuel cell goes to the Research Laboratories of the National Carbon Company, a division of Union Carbide Corporation, in Parma, Ohio.

The electricity is produced by the electrochemical reaction between hydrogen and potassium hydroxide, and water is a by-product. The hydrogen is introduced through a porous carbon tube containing an unnamed catalyst. Electrons produced at the hydrogen electrode flow through the circuit and are accepted back at the oxygen electrode by the interaction of oxygen and the electrolyte, the potassium hydroxide.

Although pure oxygen is required for higher currents, the new fuel cell can be operated with hydrogen mixed with air for smaller amounts of power. The hydrogen may also contain considerable impurities, which raises all sorts of possibilities for utilizing by-product hydrogen from industrial processes. For example, nuclear bombardment decomposes wa-

PULLMAX-First in Circle Cutting

Less Weight • Less Floor Space • Twice the Speed • Half the Cost!



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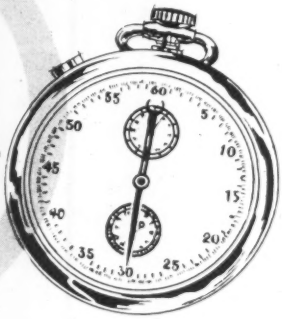

With the amazing PULLMAX Heavy Duty machines, you can cut circles to practically unlimited sizes with the utmost accuracy.

With the power feed and outside attachment PULLMAX has proved itself the fastest, most modern and accurate ring and circle shear.

A PULLMAX Machine with a power feed that operates at various speeds up to 32 lineal feet per minute and a simple outside attachment is an investment of roughly ½ the cost of other ring and circle shears.

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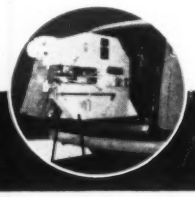


AMERICAN PULLMAX COMPANY INC.
2483 North Sheffield Avenue • Chicago 41, Illinois

See us at the 39th National Metal Exposition, International Amphitheatre, Chicago, Ill., Nov. 4-8, Booth No. 1065.

ter into hydrogen and oxygen. The fuel cells could produce power to supplement the output of atomic power plants. Petroleum refineries are another source of hydrogen. The cell has many potential industrial applications: It could power remote telephone relay stations, for instance, or provide silent power for small, portable machines. It is most desirable for high-current, low-voltage use.

The voltage of the new cell is approximately one volt. To produce higher voltages, the cells can be connected in series, just like conventional batteries. Efficiency of the new cell is 65 to 80 per cent, considerably higher than that of internal combustion engines. Starting is no problem: just turn on the hydrogen and oxygen. Previous fuel cells worked at high gas pressures and high temperatures.

"Preserving" aluminum in dry ice

Now aluminum is joining meats, fruits, and vegetables in refrigerator cars. A huge sheet of aluminum for the new jet DC-8 was recently shipped to Douglas' California plant from Alcoa's Davenport, Iowa, mill packed in dry ice. The wing section was made of a new age-hardening alloy that strengthens at room temperature. To suspend the aging process, the section was packed in tons of dry ice, which kept the alloy soft and easy to machine.

Maintaining industrial engines

Electronics is again coming to the aid of the harassed maintenance man. The Sperry Gyroscope Company, Great Neck, N.Y., has introduced an analyzer designed to help keep industrial engines at peak efficiency. It pinpoints malfunctions as they develop. One prototype is already saving $4,800 a month in an industrial plant equipped with 80 natural gas engines.

While the engine is running, the analyzer can be attached to provide data on ignition, vibration, and oil pressure. The information is presented on an oscilloscope screen. Both spark-ignition and diesel engines can be studied with the 36-pound instrument, which will cost about $1,800.

Similar analyzers have been used in the aircraft industry for years. Last year the Allen B. DuMont Laboratories in Clifton, N.J., developed one for auto mechanics. —M.M.

continued from page 53

pects available in the market." A Rhode Island manufacturer of electronic components said: "New fields are opening in electronics all the time." A roofing manufacturer in Alabama said: "Looking for growth —the South is growing." A producer of railroad bearings in Richmond, Va., based his confidence on "preparing to diversify into another part of our field." "Advancements in scientific feeding of animals should continue our forward trend," said a Minnesota feeds manufacturer.

New products from research laboratories of pharmaceutical manufacturers "will be of enormous benefit to us," said a glassware maker. A manufacturer of electrical equipment predicted, "We will grow! The electric utilities to which we sell are doubling every ten years."

Similarly, a fabricator of steel products said: "We face the future with great anticipation because of the growth in the industries we serve, such as pulpwood, paper, chemicals, and citrus."

All these viewpoints were in decided contrast to that of a lonely pessimist in Atlantic City, N.J., who thought that "all small business will gradually be forced to discontinue."

Some 30 per cent of the small business men were unable to name any specific problems that might retard their growth.

Meeting Competition

Among the 70 per cent who did mention difficulties, competition ranked first in frequency among retailers and wholesalers. Service companies and manufacturers were more confident of their ability to meet it. Small service companies met competition from service chains by offering customers better quality, at a price. Of the manufacturers who mentioned competition from larger companies, fully 50 per cent did not consider it a serious threat. Several small manufacturers said that competition was "keeping us alert."

Wholesalers complained that large retailers and manufacturers were tending to bypass the wholesaler by dealing with each other. But the bitterest comments on giant competition came from the retailers. Chief complaints from this group: the opening of new shopping centers,

MORGAN, N. J.

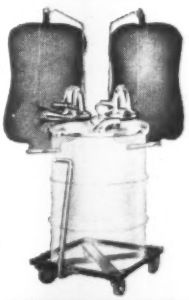
TORNADO HITS ZUBACK BOAT WORKS . . .

and sweeps it clean of wood chips and sawdust

It's not a hurricane, but a Series 80 TORNADO vacuum which daily sweeps this boat works clean of the hour by hour accumulation of wood chips and sawdust.

As work progresses on each of these famous custom Jersey Sea-Skiffs, there is a Series 80 TORNADO vacuum on the job to inhale the wood particles that gather. Net result: Zuback craftsmen are always working on a clean job . . . and clean work is more efficient work.

If you have a problem with constant waste accumulation, be it wood, metal, glass, fibre or plastic, put a wet or dry pickup TORNADO vacuum (or two) on your production line and see for yourself how this powerful and versatile vacuum can make clean work more efficient work, and profitable, too!



And when you need powerful vacuum **PLUS** larger waste storage, it's the **TORNADO JUMBO CONVERSION** unit that gets the job done. The Jumbo Conversion plate fits all standard 55-gallon drums, and with two motor units, delivers up to 3 H.P. of suction. Four wheel dolly and pulling handle complete the unit.

Write for Bulletin No. 660

BREUER ELECTRIC MFG. CO.

5106 North Ravenswood Avenue Chicago 40, Illinois

See us at the Sanitation Maintenance Show & Conference, Navy Pier, Chicago, Illinois, October 14-16, Booth 202.

featuring large department stores and ample parking; chain stores; and discount houses. A Detroit druggist said: "It is impossible for a man of my worth to combat the pricing practices and merchandising methods utilized by the chain operators. Year by year, the competition from this quarter is increasing, and I see no hope of its diminishing in the future." This man's solution to his problem was: "Service. Although this is far from a new idea, I really believe few stores actually offer it. I make every attempt to know my customers personally, and give them the type of service they cannot get from the larger stores."

"The big stores have a better selection in a bigger inventory, of course," observed a retailer of men's clothing. "Competition from the very large retailers is causing our volume and earnings to fall off," said a retailer of electrical appliances, adding, "Just plain size is such a tremendous advantage to the giant retailer that it makes it difficult to compete with any really large concern. They offer prices and services you can't beat."

Often, newcomers were attacked as vigorously as big, established business. Said a Midwestern wholesaler: "These newcomers buy their way into business in their first year by cutting prices." "They are not familiar with costs and bid unprofitably," remarked a manufacturer of advertising displays in Missouri. A Milwaukee paper jobber said: "They

III. FOUNDATIONS OF SUCCESS

What do you regard as your strongest asset?

	Mfrs.	Wholesalers	Retailers	Service Companies	Total
Service and customer relations	14.7%	32.6%	22.6%	29.0%	23.6%
Quality of products and service	17.2	13.5	27.1	21.7	20.4
Ability, reputation, and experience	14.7	18.0	14.3	7.3	14.0
Competent personnel	4.3	5.6	5.2	8.7	5.7
Equipment and facilities	7.7	3.4	6.0	4.3	5.7
Flexibility	6.0	1.1	3.0	0.0	2.9
New products	5.2	1.1	0.0	0.0	1.7
No single asset	25.9	21.3	18.0	26.1	22.3
All other	4.3	3.4	3.8	2.9	3.7

IV. PLANS FOR EXPANSION

Do you have any specific plans—that is, a new gimmick, or a new line, or a new way of selling—that might increase your sales?

No specific plans	44.9	52.1	62.6	65.1	55.0
Will add new lines or products	27.6	16.7	5.7	14.2	16.4
Will advertise more extensively	3.2	6.3	10.6	9.5	7.2
Will open new branches or accounts	0.0	15.6	1.6	3.2	4.6
Working on new designs and patents	12.6	1.0	0.0	1.6	4.4
Will feature better promotion and service	3.9	4.2	5.7	0.0	3.9
Will remodel	0.0	0.0	6.4	1.6	2.2
Will add new equipment	3.9	2.1	0.0	1.6	1.9
Will grant more credit	0.0	0.0	3.3	0.0	1.0
All other	3.9	2.0	4.1	3.2	3.4

V. WHO IS "COMPETITION"?

What is the source of your principal competition?

	Mfrs.	Wholesalers	Retailers	Service Companies	Total
Large companies	34.5%	34.3%	44.0%	37.3%	37.6%
Newcomers	14.8	18.6	15.2	19.4	16.5
Similar size concerns	50.7	47.1	40.8	43.3	45.9

How Did This Problem Get To Management's Desk?

It all began when Management noted a high reject percentage on a weekly production report. (A routine inquiry revealed that a molded plastic component wouldn't accept the fasteners without occasional chipping or cracking).

Where did the fault lie?—In the plastic of course, but how did it get this far along and who was responsible? Engineering with improper specifications or Purchasing—(price buying again)?

At any rate, an alert supplier would have helped. An alert supplier would have required **all** the facts.

Then why not specify a reliable supplier, a really INTERESTED supplier. One not **too** large and still not small. One that would really work for you on all phases of the job.

If you are interested in locating such a supplier in the plastic injection molding field, write for a Lor-El brochure or ask for a representative to call. Telephone or write: OLdfield 3-4066.

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COMPANY,
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SPECIALISTS... in Product Design, Mold Building, Molding and Assembly

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are a thorn in my side. They and others who don't know their costs never give a thought to what is required of a man in business until they're in; then they come crying."

Roadside stores that sell along the highways bothered quite a few retailers. Some even wanted new laws passed to keep these outlets from staying open on Sunday.

Capital and Personnel

It was to be expected that lack of adequate capital and financing would be among the difficulties frequently mentioned, and it was—and by many who were not marginal operators. But lack of competent personnel was mentioned frequently also. The owner of a business in Seattle complained, "I could do a better job if my employees showed more interest." A large number were worried about the shortage of skilled workers, technicians, or good salesmen.

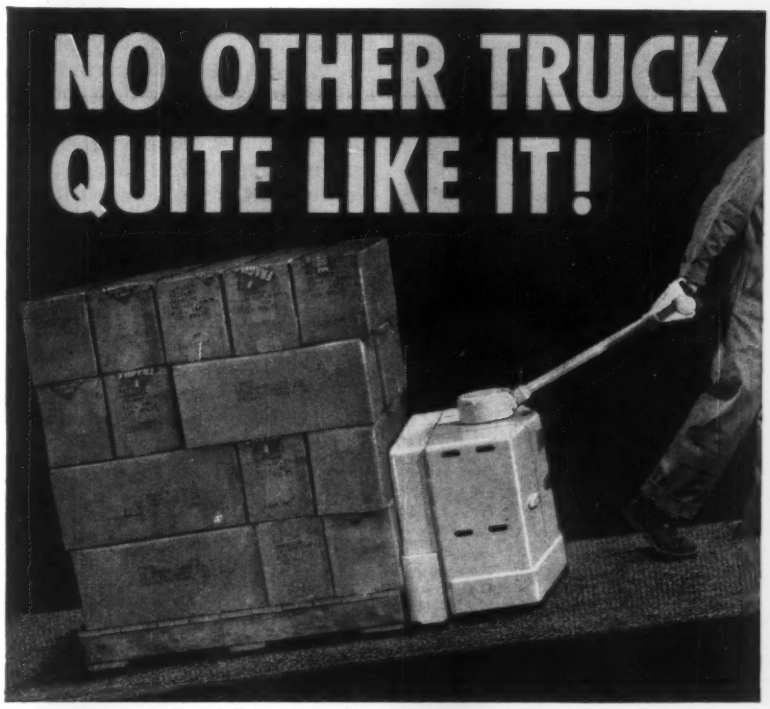
Moreover, many who mentioned lack of capital and financing viewed this as a problem of expansion, not one of survival.

Other unfavorable factors mentioned were varied: economic conditions, reduced levels of residential construction, strikes, deterioration of neighborhood, illness, credit practices, lack of management depth, growing pains, and even, according to one man, "the get-rich-quick attitude of young people entering the field."

On the other side of the coin, there was a solid core of small business men who could point with pride to tangible advantages and qualifications they felt had contributed to their progress. When asked, "What is your strongest asset?" nearly 23 per cent simply mentioned "good service and sound customer relations." For those who would dismiss such fundamentals of business as time-worn clichés, let it be emphasized that, among the business men consulted in this survey, there was no disposition to underplay service.

"We believe in doing better than our competition," commented a wholesaler of plumbing supplies. "We ship 95 per cent of our orders the same day as received." An electronics components manufacturer remarked: "While our competitors have standard items, we will make products to customer specifications."

Similarly, the business men found



FLATTENS OUT STEEP RAMPS even with full-capacity load because its four 6-volt batteries supply up to 24 volts—twice the voltage of ordinary walkies. Total of 3 separate speeds, forward and reverse. All controls on handle.

Model WL4F Capacity 4000 lbs.

COMPLETELY SAFE IN TIGHT SPOTS Exclusive Raymond safety control (a pressure-sensitive switch on end of handle) automatically puts truck in reverse when it touches operator's body.

LIGHTER, MORE MANEUVERABLE Only ⅔ the weight of conventional walkies. Works in close quarters and narrow aisles because of its short overall length and wide steering arc.

RAYMOND ELECTRIC PALLET TRUCK

CLIP AND MAIL THIS COUPON

The RAYMOND CORPORATION

4640 Madison St., Greene, N.Y.

☐ Send latest Raymond Electric Pallet Truck Bulletin

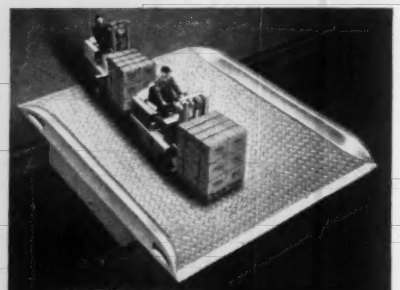
☐ Have a Raymond representative call on me

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____



an EXTRA power truck for the price of a DOCK BOARD!

Power trucks move more loads faster . . . rolling across Magliner magnesium dock boards! Men, loads and equipment move *fast, sure, safe* . . . efficiency goes up and loading costs go down! As one customer put it:—"*It's like having an extra power truck . . . for the price of a dock board!*"

Engineered to meet your specific dock requirements, Magliners are made of magnesium for easy one-man handling. Magliners are built to take it . . . safely handle loads up to 10 tons. Other dividends? Low initial cost. Less maintenance. Dependable, long-life service. Big, important cost-savings—*ALL* ways! Put Magliners to work on your docks!

Write for Bulletin DB-204

MagLiner MAGNESIUM DOCK BOARDS

MAGLINE INC., P.O. BOX 310, PINCONNING, MICH.

Canadian Factory: Magline of Canada Ltd., Renfrew, Ontario

weigh the modern way! cut your costs!

use a ® HYDROSCALE ON YOUR CRANE HOOK

ALL WEIGHING IS DONE ON YOUR CRANE HOOK

OUTMODES COSTLY CENTRAL WEIGHING STATION

COMPLETE LINE OF 110 MODELS NOW AVAILABLE

TYPICAL WEIGHING APPLICATIONS

Just a few of the many applications include—loading, unloading, batching, check weighing, foundry charging, production control, process control, checking inventory, and, protecting your equipment from overloading.

SAVE FLOOR SPACE!

SAVE MONEY!

SAVE TIME!

HYDROSCALES guaranteed—

to be free of defects in workmanship and materials, and accurate to ½ of 1% of the maximum dial capacity.

Write for descriptive literature explaining model features.

HYDROWAY SCALES, INC.

31286 Stephenson Hwy. • Royal Oak, Mich.

"The world's largest producer of crane scales"

satisfaction in the quality of their goods, their experience, reputations, and business ability, their physical equipment, and the competence of their personnel. Finally, their very smallness appealed to some as a noteworthy asset, since they felt it made for flexibility. One concern put it like this: "We are small enough so that our management can get closer to the customer and find out just what he wants."

Plans for Expansion

Among the more provocative responses and reactions were those in answer to the question: "Do you have any specific plans, that is, a new gimmick, or a new line, or a new way of selling which might increase your business?" The replies reflected ingenuity and willingness to try new approaches. But razzle-dazzle gimmicks found no favor. For many, the bread-and-butter approach of "better salesmanship and service" was sufficient.

"Am installing self-service to give better service and lower prices to customers," said a hardware retailer in Milwaukee. A New Jersey manufacturer of jewelry findings reported that a change in method-of-operation to metal stampings resulted in success. "Will set up a mail advertising campaign, hitting new areas, doing more promotional work, carrying better grades of merchandise," said a St. Louis manufacturer. Another said: "Will continue top-grade workmanship, call back on older customers, do a better follow-up."

A delivery service proposed to equip its trucks with two-way radio to answer calls, and a women's apparel store planned to convert a rear lot into a playground for the convenience of shoppers with youngsters.

The desire to grow in size and capital, and to be independent, are dominant characteristics of small business men. But, paradoxically, they also tend to be optimistic complainers. One individual, who found fault with current economic trends,

VI. THE SHAPE OF TOMORROW

How do you view your opportunities in the future?

	Mfrs.	Wholesalers	Retailers	Service Companies	Total
Bright	34.7%	29.5%	21.5%	38.7%	29.8%
Good	53.8	58.0	50.7	46.8	52.6
So-so	6.9	10.2	17.1	9.7	11.4
Poor	4.6	2.3	10.7	4.8	6.2

Do you contemplate remaining in this business?

Yes	97.6%	98.8%	96.8%	97.1%	98.0%
No	0.8	1.2	1.6	2.9	1.5
Don't know	1.6	0.0	1.6	0.0	0.5

Would you sell out if you could get a price equal to what the business is now worth?

Yes	10.9%	11.8%	15.4%	18.5%	13.7%
No	79.8	84.6	79.3	80.0	80.7
Perhaps	5.4	2.4	3.8	1.5	3.7
Don't know	3.9	1.2	1.5	0.0	1.9

VII. LOOKING IN THE HOPE CHEST

Do you have any special needs in the way of money, materials, people, or government legislation to help your growth?

Money	28.4%	23.8%	20.6%	22.1%	23.8%
People	18.4	18.8	15.0	22.0	17.9
Tax reduction	15.6	16.8	20.0	18.2	17.7
Materials	2.1	0.0	0.6	3.9	1.5
Other legislation*	13.5	14.9	13.8	13.0	13.8
No special needs	22.0	25.7	30.0	20.8	25.3

*Includes legislation regarding housing, tariffs and imports, price cutting, Fair Trade, measures for cutting costs, curbing unions, curbing big business, curbing inflation, lower postal rates, more governmental spending, less governmental spending, regulating buying cooperative, trade discounts, controlling chain stores, controlling worthless checks, and prohibiting Sunday shopping.

said: "I budgeted for a 12 per cent sales increase and only made a 5 per cent gain."

For these, and for the small business men generally, a special question was designed to test their individual attitudes and outlooks in the face of problems, grievances, and gripes. The question read: "Would you sell out if you could get a price equal to what the business is now worth?"

The answers to this question indicated that more than 80 per cent of these business men are in business to stay. About 5.5 per cent are not sure. Of the remainder, many of those who would sell had shrewd reservations. More than half of those who would sell rapidly calculated the prospects of tax savings from capital gains before replying. "Sure I'd sell," said a wholesaler, "but I'd go right back into business again." An overwhelming 98 per cent of those interviewed said that they expected to continue in their present businesses. Those who would decidedly not sell spoke strongly. "Wouldn't sell for three times worth," said a Kansas City, Mo., retailer of men's furnishings. "Could have sold at a favorable price recently, but turned down the offer," said a Cleveland electric fixtures manufacturer.

Some of the business men were philosophical. "Money isn't everything," stated one. "Have no reason to sell. I like being a business man," said another. Lastly, there were business men whose views indicated that, in business, man lives not by profit alone. A goodly number were looking ahead to the time when they would turn the reins over to the next generation. They were, in short, building something which they could pass on to their sons.

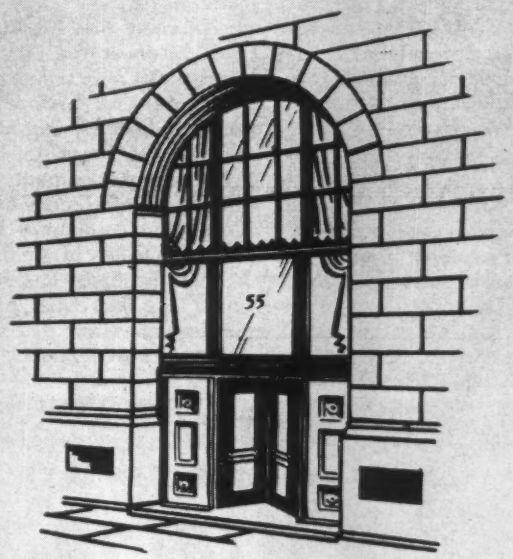
Special Assistance

The last question in the survey invited the business men to comment on their needs—for money, materials, people, and legislation. One out of every four could find no reason for special outside help. "We're doing just fine, don't need help," was the confident remark of a sheet metal manufacturer. "Just give us more customers," said a castings manufacturer.

Others proposed a variety of legislation. Recommendations included: housing, tariffs, fewer reports to Federal agencies, "curbing of big busi-

Our service is tailored to provide all the working capital any qualified client needs, without increased borrowing, diluting profits or interfering with management.

Information available for any manufacturer or distributor with $500,000 or more annual sales.



Textile Banking Company

55 Madison Avenue, New York 10, N.Y.

Providing operational financing for the apparel, electronics, furniture, leather, plastics and textile industries.

Subsidiaries:

T. B. C. Associates, Inc., New York Southwest Texbanc, Inc., St. Louis

ice-foe

Special ice-melting compound melts hazardous ice and snow quickly, easily . . . no messy rings or residue! Available at leading sanitary supply distributors or write to Walton-March, Dept. DR, 1935 Sheridan Rd., Highland Park, Ill.

UNEXCELLED

Contest Prize or Gift

$465 up

GAS OR ELECTRIC POWERED

Phone or write for details and discounts

POWER CAR CO. 150 Willow St., Mystic, Conn.

ness," "curbing of big unions," "curbing inflation," "lower postal rates," less Government spending, more Government spending, and such sundry suggestions as controlling the passing of worthless checks and prohibiting Sunday business. Easy money was a commonly mentioned need. But taxes received the most criticism. Many of the respondents felt that small business was entitled to special tax consideration to stimulate expansion.

Over-all, the survey of small business leaves one strong impression: that small business has more strength than is generally supposed. Time and again, the answers given by individual business men not only reflected general progress, but strong confidence in the future. If there was a certain youthfulness in this optimism, it was because so many small concerns are young businesses hoping for full stature. And though they are young, they are surprisingly mature. Much has been made in the past of the struggle of small business against "big business." The survey supported to some extent the belief that small businesses must struggle competitively against those that are larger. Yet small business is not afraid to pick on its older brothers. Small business may be armed lightly, but as it peppers its larger opponent, it can make its presence felt.

They Need Each Other

Then again, perhaps this struggle of small versus big business has been overstated. The two are more mutually interdependent than opposed. Small business needs big business to supply it with new products as well as with staples, and it looks to the research of big business to furnish materials for new goods and services to customers. And big business needs small business too. It needs small business not only as a distributor, but as a fabricator and as a supplier. For little business can often produce and market items to big business that the latter cannot turn out as quickly, as efficiently, or as cheaply. Most giant companies buy supplies from thousands of small companies.

Small business has its problems. But it also has plans, plus the energies to make these plans effective. In its fierce independence, small business would like to do something on its own about these problems. It would, for example, rather create its own equity capital by retaining a larger share of its earnings before taxes than look to Government for help on term loans.

Problems or no, small business is a long way from cashing in its chips. There may be outsiders who would summon the undertaker, but the bulk of small business rebels against a decent burial. If it is dying, small business acts less like a corpse than like one who intends to have some fun at his own wake.

Small business expresses some clear-cut needs. It would appreciate any help which would equip it better for a fair fight. It could use technical information, knowledge of the results of laboratory research, and a considerable amount of management guidance. It is not in any mood for being talked down to—it resents condescension.

And it is seldom defeatist. It may ask for protection, but it doesn't want coddling. Finally, it intends to go places—not in an undertaker's hearse but in a shining new car. END

CONSTRUCTED BY
Wigton-Abbott
CORPORATION
Metal Container Plant being erected for the Continental Can Company, Inc. at Sharonville, Ohio by the Wigton-Abbott Corp.
Economic Surveys, Reports and Analyses
Development of New Processes and Equipment Installation
Industrial Design and Construction and Conversion of Existing Facilities
Wigton-Abbott Corporation
ENGINEERS & CONSTRUCTORS
Main Office
PLAINFIELD, N. J.
WA
Est. 1924

THE NEGRO MARKET
continued from page 55

as compared with 41 per cent of the whites. Although the Negro's life expectancy has increased by 25 per cent since World War I, less than 6 per cent are 65 or older, an age bracket comprising nearly 9 per cent of the whites. The average for all Negroes is 25.1 years, over five years younger than the average white American.

The greatest unfulfilled need and desire is housing, caused for the most part by sociological barriers even in the Northern communities. Still, one-third own their own homes, and while white home ownership increased 84 per cent during the 1940–1950 housing boom, Negro ownership rose a remarkable 137 per cent. The gain would have been even higher but for the fact that of the 9 million new housing units constructed by private builders between 1935 to 1950, only slightly more than 1 per cent were made available to Negroes. Government studies show an additional 2.5 million homes are still needed.

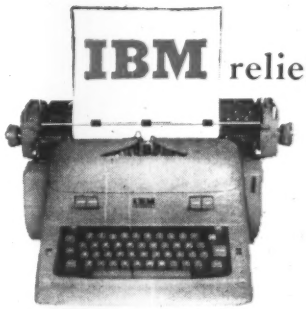
It is this very situation that releases frustrated housing funds into other channels. In the rest of the marketplace the Negro has almost complete freedom of choice, and he exercises that freedom to the utmost.

Quality Goods Wanted

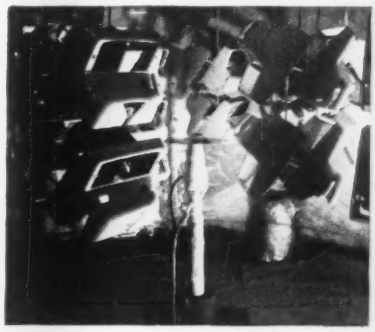
An *Ebony* magazine study reveals that the average Negro consumer spends more for clothing, food, cosmetics, toiletries, automobiles, and liquor than his white counterpart. "In proportion to population and income, Negroes buy more quality products than any other comparable U.S. group," it said. Where they can afford it, Negroes buy the best clothing, the top automobiles, highest-priced radio and TV sets, and leading prestige-brand food products.

In almost every case, the study disclosed, they name their brand and stick to it as long as it merits their patronage. Therefore, three or four manufacturers of each product get the bulk of the business. In short, the Negro spends more on certain categories of consumer goods—on clothing, personal grooming, food and house furnishings.

Department of Labor statistics show that Negroes spend more money on food (28 per cent of each



IBM relies on **RANSBURG NO. 2 PROCESS Electrostatic Spray Painting** to get the excellent and uniform high quality wrinkle finish on all **IBM ELECTRIC TYPEWRITERS**



Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

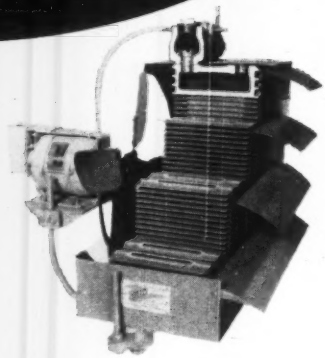
Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.

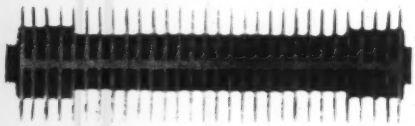
Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana
RANSBURG

*ends Unit Heater Maintenance Problems!

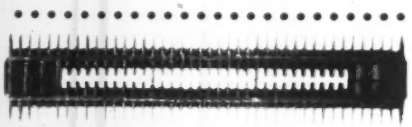
Your answer to unit heater problems general industries have discovered through common failures of copper, aluminum, and steel tube heat transfer surface. GRID condenser eliminates internal electrolytic corrosion—because all metals in contact with steam are similar. GRID also eliminates external corrosion—because the cast iron construction resists acid or other fumes in the air and eliminates the use of reducing valves where high steam pressure is used. GRID cast iron construction is tested to withstand steam pressures up to 250 P.S.I. . . . 450° temperature. GRID eliminates the high maintenance costs generally experienced with other types of condenser construction . . . eliminates replacement costs because GRID is built to last for years . . . uninterrupted service records of more than twenty years are common among GRID users in general industry. Study the illustrations and descriptions—and you will see why GRID gives you maximum heating performance always.



Cut-away view of Model 2000 GRID Unit Heater . . . note double steam chambers in each fin section and wide fin spacing . . . fins are cast integral with steam chamber.



All cast iron one-piece, single chamber fin section used in Model 1000 and Model 1200 GRID Unit Heaters . . . note wide fin spacing and ample radiation surface.



All cast iron, one piece, double chamber fin sections are used in Model 1500 through models 3000 GRID Unit Heaters, all GRID Blast Heaters and all GRID Radiators. Wide fin spacing prevents clogging by lint or dust . . . finned surface is easily cleaned . . . straight through air passage reduces resistance. Steam inlet at top serves both steam chambers permitting quick, even steam distribution. Outlet section at bottom serves both steam chambers permitting quick condensate discharge. Inlet and outlet openings are 1" P. T.

Send for the complete story on GRID Unit Heaters, GRID Blast Heaters, and GRID Radiation for industrial plant use . . . it is contained in GRID Products Catalog No. 956. Write today for your copy.

D. J. MURRAY MANUFACTURING CO.

MANUFACTURERS SINCE 1883

WAUSAU, WISCONSIN

dollar) than whites in the same income bracket—more meat, poultry, and fish.

A Memphis, Tenn., pilot study conducted by Batten, Barton, Durstine & Osborn has indicated that the average Negro woman buys 63 per cent more hosiery and pays anywhere from 25 to 50 per cent more per pair than does the average white woman. Not only that, but the Negro woman sticks to the better grades while the white woman will switch between good and cheap brands.

Another advertising executive put it this way: "Negroes do not want cheap, second-rate imitations. When they buy food, they prefer the best brands. When they buy automobiles, appliances, and other home furnishings, they buy the best. Branded merchandise has always enjoyed the strongest acceptance so long as the pocketbook could possibly buy it."

Merchants in many areas still screen credit applications carefully, however. Although the rate of replevin has dropped considerably among Negroes since prewar days—as income became higher and more responsible habits were instilled—installment sellers admit that there is still "a higher percentage of losses" than among whites.

Breakdown on Spending

A Johnson Publishing Co. survey of its readers shows that the average Negro family spends $19 a week on food, $6 a week on entertainment, $2 for alcoholic beverages, and a like amount on tobacco. It spends $16 a month on clothing, $3 each month on drugs and proprietaries, $3 on cosmetics and toiletries, $9 on automobile transportation, and $3 on other forms of transportation.

Of those who own their own homes, the study showed, approximately 57 per cent value them at between $7,500 to $12,500. Of those that rent, more than 82 per cent pay between $26 and $85 a month. About 86 per cent carry life insurance.

But while the Negro strives to catch up to the rest of America, which had a 30-year head start in becoming essentially an urban society, he exercises a strong selectivity. More than anything else we wants to have full membership in society, but he has learned the power of a dollar. He knows that while some of his own activities are still circumscribed, his money is unsegregated.

That is one of the reasons he wants to feel that his trade is welcomed by reputable manufacturers and merchants. There are several ways of extending such an invitation. A Starch readership survey points out that ads showing Negro models get three times the attention and preference. That one effort alone gives an advertiser a triple advantage over competitors.

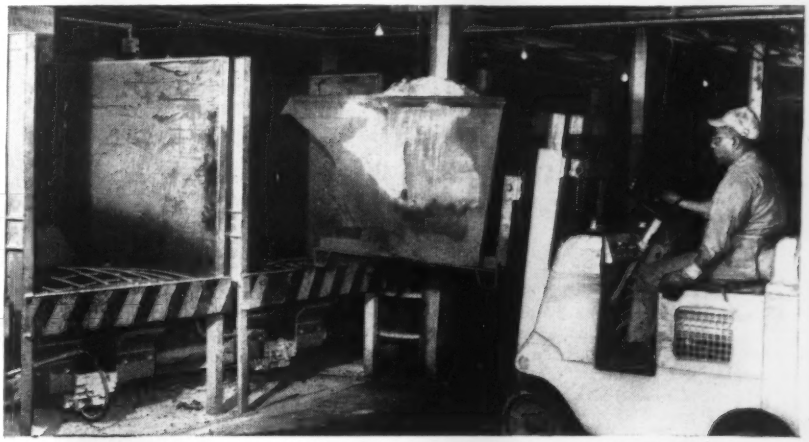
Dislike of Stereotypes

On the subject of advertising illustrations, Negroes have some decided opinions. For instance, they are weary of always being depicted as servants or happy-go-lucky minstrels. (Resentment of the latter theme is considered one reason why Lucky Strike cigarettes, with its "Be Happy, Go Lucky" slogan, has failed to catch on with this market).

Even more important than individual campaigns is the Negroes' over-all feeling that they would like to be shown enjoying family and recreational activities. Such things, it was explained, will demonstrate that the advertiser regards the Negro as a dignified member of the community and wants his business. You also appeal to his ego by inviting him to buy the best you have to offer. After so many years of being cheated by slick salesmen offering shoddy goods at "bargain" rates, after so many years of being the dumping ground for every inferior commodity, the Negro now prizes his new-found ability to be selective. And he appreciates it when only the best is offered to him.

Because his color marks him as a member of a minority group, he has been accused—even by his own leaders—as being too color-conscious. In the main he resents constant reminders of his origins in this country.

An example of this resentment is the action reportedly taken against Quaker Oats' use of the Aunt Jemima and Uncle Mose characters. It is reported that a group of Negro leaders met with Quaker officials to get them to "clean up" what the many Negroes regarded as offensive caricatures. Whether or not such a meeting ever took place, the fact remains that Aunt Jemima advertising has changed. Whereas she was originally depicted as a stout, extremely black, somewhat slovenly kitchen slavey, today her skin color has been lightened, and her features and



Ball Brothers cut handling costs with Self-Dumping Hoppers

Here's how Ball Brothers Company of Muncie, Indiana, manufacturers of glass containers, solved cullet handling problems, eliminating slow, costly manual labor. They formerly used wooden boxes, vats, steel barrels and man power. This method was slow, cost of handling high. Now, 80 Roura Self-Dumping Hoppers are stationed under the firm's container-forming machines. Molten scrap glass is shunted down chutes into waiting Hoppers. A standard lift truck picks up full Hoppers and transfers them quickly to a cullet crusher. With the flip of a latch, the Hopper automatically dumps its load, rights itself, locks itself, ready for another load. One man does the entire handling job.

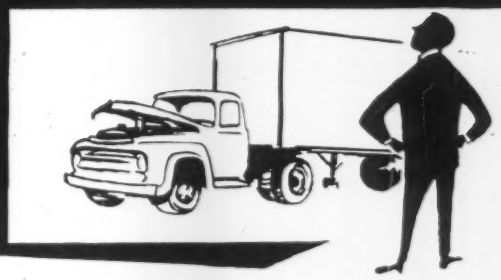
Roura Self-Dumping Hoppers fit any standard lift truck . . . handle wet or dry, hot or cold bulky materials. When there are problems of contamination or corrosion, stainless steel or stainless lined hoppers can be supplied.

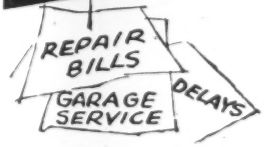
ROURA *Self-Dumping* **HOPPER**

WANT MORE DETAILS? Attach this coupon to your letterhead and mail to

ROURA IRON WORKS, INC.
1404 Woodland Ave., Detroit, Michigan

HOW CAN I STOP TRUCK UP-KEEP WORRIES?





YOU CAN ELIMINATE not only maintenance worries, but licensing, insurance and a thousand other headaches when you LEASE your trucks from an NTLS member-company. Trucks are engineered to your needs, always in top appearance and operating condition. Don't use your capital to add to your maintenance worries! Full-service NTLS truckleasing furnishes *everything* but the driver. Write for folder.

National
TRUCK LEASING SYSTEM
23 E. JACKSON BLVD. • SUITED-10
CHICAGO 4, ILLINOIS
Members in principal cities

What's Your Loading Problem?

☐ GROUND LEVEL LOADING? ☐ YARD CAR HANDLING?
☐ INADEQUATE DOCK FACILITIES? ☐ TEAM TRACKS?

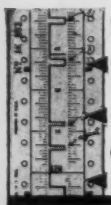
THIS MAGLINER MAGNESIUM LOADING DOCK ON WHEELS CAN SAVE YOU THOUSANDS OF DOLLARS! REPAY ITS COST IN JUST A FEW MONTHS!

If you have no dock; an older building; a yard handling problem; need extra or movable dock facilities—then the Magliner Mobile Loading Ramp can solve your problem too! Combining magnesium strength with magnesium lightness—Magliner loading ramps can be moved by one man . . . give you a "loading dock" *where and when you want it*! Magliner loading ramps eliminate hand loading . . . speed operations . . . cut expense! For highway trailers and yard cars. Get the Facts—write today for Bulletin DB-211.

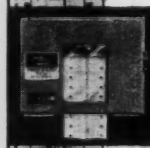
Mobile Loading Ramp

MAGLINE INC., P. O. BOX 1310, PINCONNING, MICH.

Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario



YOUR *complete* PRODUCTION STORY *on tape!*



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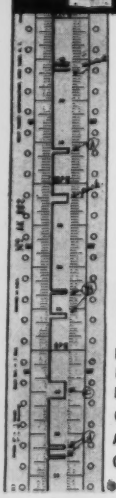

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costume have been made more attractive. Also, it is noted that Aunt Jemima and Uncle Mose character premiums, once one of the most popular, have not been used in the past few years.

There is no doubt that even thoughtless ridicule can be extremely damaging. An Indianapolis newspaper advertisement for a storm-window manufacturer, which showed a Negro crawling through a melon patch pushing a stolen watermelon

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THE AUTHOR • Robert S. LaVine has served on the staffs of several consumer magazines and has been a reporter for a news service and small-town newspapers. During the war, he was on the staff of *Stars & Stripes*, the armed services newspaper, and edited other Army publications. His college career encompassed two pre-war years at Boston University and two post-war years at Long Island University, where he majored in journalism. He has been covering the marketing field for *Premium Practice* magazine for nearly six years, about half that time as editor.

---

before him, caused a storm among that city's 65,000 Negro population and got the manufacturer into serious difficulties.

For those who missed the ad in the metropolitan daily papers, the Negro weekly, *Indianapolis Record*, played it up as a Page One feature. This excursion into questionable humor cost that manufacturer 11 per cent of his market. It is further believed that the resentment even spread to include other storm-window companies selling in that area.

A Houston bakery, considered the largest in Texas, sent out an S.O.S. for a Los Angeles Negro marketing expert to help stem a strangling boycott. Since its business was almost entirely local, the loss of a potential 189,000 Negro customers, who make up 21 per cent of the population, could have been fatal. A study of the situation revealed a widespread report that the bakery was a heavy supporter of the White Citizens Council. The rumor was found baseless and was so reported by the local Negro press.

(The power of Negro media can be gleaned from these figures: The three top magazines have a combined circulation of 1.1 million; there are about 180 newspapers with a

combined circulation of 3 million; and there are, according to *Sponsor*, a radio-television trade magazine, 600 radio stations in this country that allot at least a portion of their broadcast time to "Negro programs.")

The term used for his race is also important to the Negro. Either "Negro" or "Colored" (always capitalized) is proper today. "Negress," however, is considered insulting. Some warn it is better to use the word "Colored" in the South because of the white Southerner's tendency to pronounce the other as "Nigra" at best.

These are some of the more obvious pitfalls facing any organization attempting to appeal to this market. There are other more subtle, but distinctly important, aspects.

For instance, the over-all advertising campaign can be faultless, yet fruitless if the sales personnel—the company's ambassadors—fail in their personal contacts with the Negro consumer. Obviously the salesman always should be friendly, but never patronizing.

Although the Negro is an individual, it should be recognized that a great deal of good will can be gained by working through church, fraternal, civic, and social organizations. Negro life centers to a large degree around them.

The Same Response

Perhaps the prime tenet would be: Don't talk down to him. The Negro has had a whole lifetime of recognizing when he is being talked down to—and he doesn't like it.

Basically, Negroes respond to sales appeals in much the same manner as others. They appreciate an intelligent sales approach and courtesy. The Negro *is* different, but not just because of his color. It is what that color has meant to him—his personal experience, his associations, his psychology. It has marked him as a member of a minority.

There is nothing hypothetical about this or his reactions to it. They influence his buying motivations, brand loyalty, and product preference.

The Negro today is making more money and has been extended more credit. He is a good prospect, and industry would do well to take him seriously. For this—America's homegrown $16 billion market—is big enough to have a major effect on any company's sales. END

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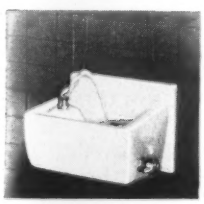

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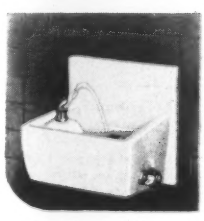

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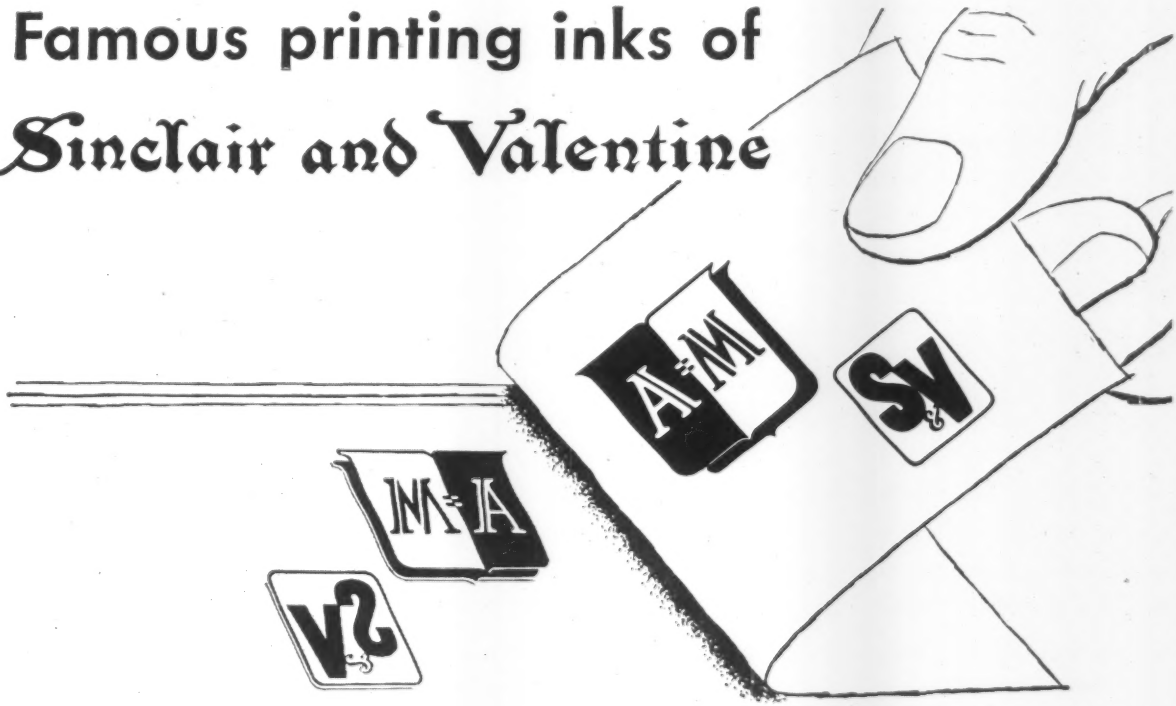

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TOO MUCH TENSION

THE GROWING pains of prosperity are as intense, and can be as deadly, as the aches of an aging boom. The question is: Which do we have now?

There's a persistent and unrelaxing tension surrounding our economy at present. The over-all gains reflected in gross national product are indicative of the size and momentum of our growth. But we cannot ignore some evidences of fatigue from abnormal and unhealthy pressures.

The elasticity of the economy is due to the expanding and contracting quality of our credits, which, in free movement, have a proper balance of give and take. The tight money situation indicates a natural, defensive resistance to the inflationary pressures, the instinct to move toward stability of prices and values. A growing country, enlarging its output to meet requirements, needs credit dollars to stimulate the output of durables, wearables, and edibles for an increasing population, and to provide the funds for plant expansion and power tool replacement. What is the measure of this demand? The test of production is consumption—not for the day, when there may be abnormal shortages, but over the long run, when machine capacity, supported by a cooperative attitude on labor's part, measures its stride with consumption.

Much of our gain in personal and corporate incomes since 1929 or 1939 has been real. But not enough of the income is converted into savings to provide for the needed physical equipment at stable prices. The credit dollar has run out of breath trying to do all the errands it is called upon to perform in an economy of changing products and techniques.

The production machine rolls along with impressive statistics, but there are several spots where the graphs sag from market weakness. In a number of areas sales are lagging, inventories are accumulating, profits fading, and craftsmen are looking for jobs, at least seasonally. It is impossible for management in a competitive economy to compensate fully for every shift in the market. In fact, the occasional jar to equilibrium has its benefits. The primary danger is that we may consider inflation inevitable and accept the thief as a business partner.

The long wave of prosperity with high sales momentum has covered up management errors that are painfully apparent whenever the wave recedes. Any minor dip in sales becomes alarming as expenses stay high and adamant, and taxes step in ahead of profits and say, "Me first." The law of diminishing returns eventually catches up with a price spiral.

What are the corrective steps to lessen tension and replace the illusion inspired by the binge dollar of defense spending and by the sponge dollar of the wage-price spiral? The question is academic and the answers are copybook mottoes, but they have to be stated as a reminder of fundamentals in management.

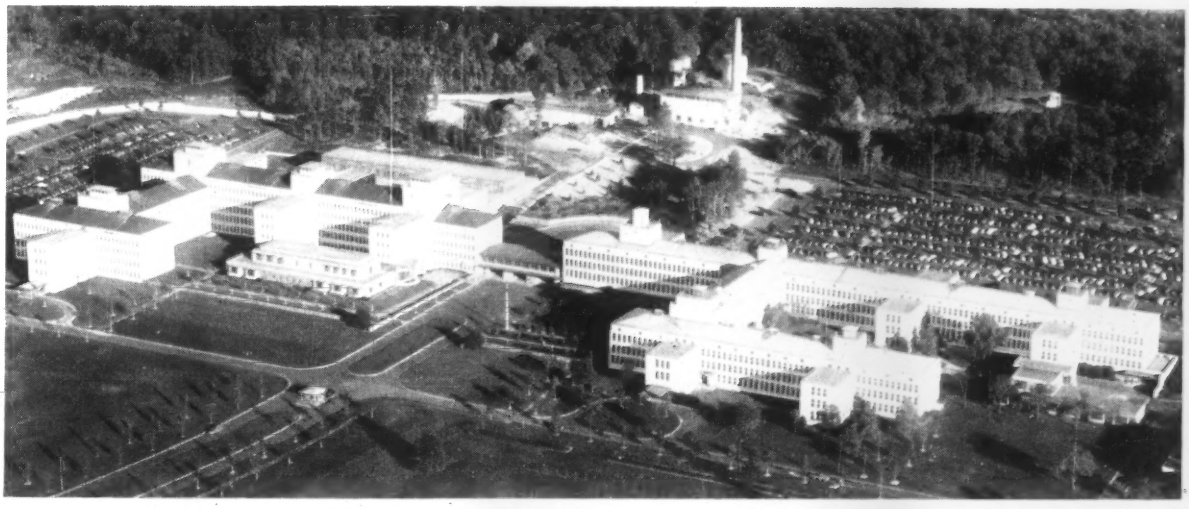
1. The relationship of production to consumption must be surveyed. The machine can be a tyrant as well as a servant. Capacity must be measured to markets, actual and potential; to the competition, known and probable; and to the element of change in customer attitude. There is nothing so money-hungry as idle equipment or so destructive of profits as inventories that are too large or too small.

2. Personal and corporate thrift must increase if we are to invest a larger proportion of our resources as an incentive to manufacturing and distribution. The new interest rates make saving more attractive. The credit dollar is minted of lighter alloy and rolls faster than specie, but the credit dollar cannot exist without the hard core of thrift.

3. Management capacity should be reviewed at all levels, especially middle management, where the deadwood is apt to linger in key positions and the talented wait too long for recognition. Don't be afraid of shifts in responsibility.

If there is a sober note in this warning to management against laissez-faire, it is intentional. It's high time to valve off some air from the windy optimists and to establish realistic checkpoints for the whole structure of our business anatomy. Business is good, but how good is good, and by what standards? Perhaps we could listen to Horace, the shrewd old Roman poet, who cautioned, "If good luck fill your sails with generous winds, take half the canvas in."

The Editors



Bell Telephone Laboratories, Murray Hill, N. J.

DREAMS WITH A PURPOSE

"Leave the beaten track occasionally and dive into the woods. You will be certain to find something you have never seen before."

ALEXANDER GRAHAM BELL

There have always been dreams and high hopes in the communications business. And always, for something over eighty years, there has been continuous and determined research to help make those dreams come true.

For before there was a telephone there was a telephone laboratory.

First it was just two men, Bell and Watson, in an attic workshop. Then the idea grew, as the need grew, and the practical values of research became more and more apparent.

Today there are more than 10,000 people at Bell Telephone Laboratories, of whom over 3000 are trained scientists and engineers.

Their work covers many fields and goes exploring and developing in many directions. But everything is directed to one goal. It is the betterment of communications service and the finding of ways to provide this better service at the lowest cost to the customer.

The great assets of the Bell Laboratories are the judgment and knowledge that have been gained from years of experience, combined with the enthusiasm of minds versed in the newest scientific knowledge.

There is also the encouragement of initiative through a careful balance of pure research and developmental work. The scientist is given a freedom that is rare in industrial work.

Some of the great achievements of the Bell Laboratories have come in recent years.

The Transistor is a Bell Telephone Laboratories invention. So is the Solar Battery. So, too, are the switching machines that have brought about Direct Distance Dialing. And, again, there was the development of those wonderful amplifiers for the undersea telephone cables.

It all adds up to a great deal of progress. But there is much more to come. All that has been done is but the beginning.

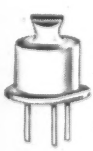
Never have there been so many opportunities for wholly new developments in telephone service and so much well-rounded research behind them.

Each day there are excursions off the beaten path, revealing something that has never been seen before.

Working together to bring people together
BELL TELEPHONE SYSTEM.

BELL SOLAR BATTERY

Converts sun's rays into usable amounts of electricity by means of specially treated discs of silicon. Has been used experimentally to power rural telephone lines.



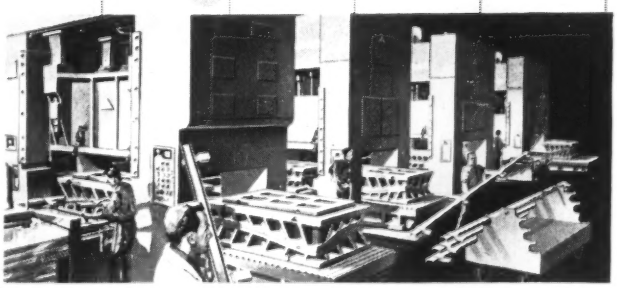
ACTUAL SIZE

THE TRANSISTOR

One of the break-throughs in science that come only at rare intervals. This mighty mite can do many of the things that an electronic tube can do and more besides!

DIRECT DISTANCE DIALING

By the end of this year some 5,300,000 telephone customers in 440 localities will be able to dial directly to as many as 35,000,000 telephones all around the country.



What to do about the

Sales Up - Profits Down

problem

A NEW KIND OF AUTOMATION

Here's an automated answer to the profit squeeze. A press line like the one above can turn out completed parts automatically. A minimum of manpower is required and in-process material handling is entirely eliminated. This automated line is not confined to producing just one part either. In about half an hour the whole line can be converted—the feed changed, new dies set—to production of another run. As shown above, the new dies are set up outside the press. The press bolster rolls on wheels through the die area. Old dies out, new dies in place in a matter of minutes. Presses can be operated manually too. So here is full time or part time automation to meet the changing needs of daily production.

A new kind of automation? We should say many different kinds—a wealth of ideas to help you smother declining profits with greatly increased productivity. Find out about the new look in press automation. A call or letter to Clearing will start a friendly discussion of your problem. No obligation.

We are preparing a booklet on "The New Economics of Press Automation." Why not let us reserve a copy for you?

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